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- A Technical supplement of the West-Central  
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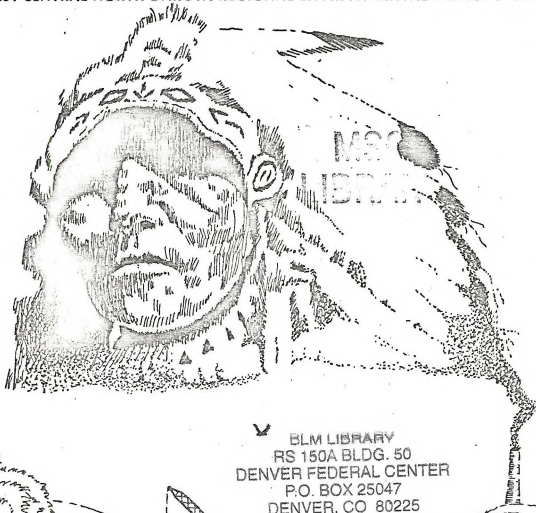
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# COAL RELATED IMPACTS TO THE FORT BERTHOLD RESERVATION

A TECHNICAL SUPPLEMENT OF THE  
WEST-CENTRAL NORTH DAKOTA REGIONAL ENVIRONMENTAL IMPACT STUDY

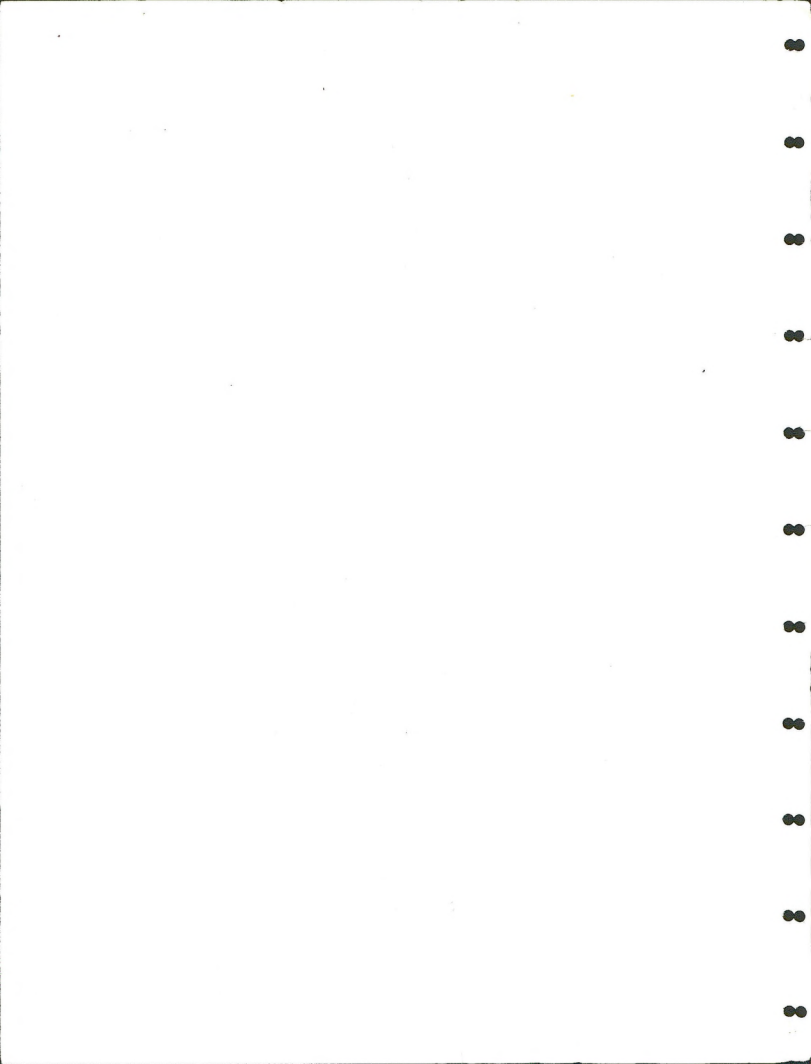
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BUREAU OF LAND MANAGEMENT

STATE OF NORTH DAKOTA



COAL RELATED IMPACTS  
TO THE  
FT. BERTHOLD INDIAN RESERVATION

A TECHNICAL REPORT  
OF THE  
WEST-CENTRAL NORTH DAKOTA  
REGIONAL ENVIRONMENTAL IMPACT STUDY

Prepared by Claryca Schettler of the North Dakota Indian  
Affairs Commission in cooperation with the U.S. Department of  
Interior, Bureau of Land Management, and the Natural Resources  
Council of the State of North Dakota.

March 1, 1978





## PREFACE

This document has been prepared to supplement information contained in the West-Central North Dakota Regional Environmental Impact Study on Energy Development. Where feasible, data supportive of the study were included in the body of the study document itself in the form of appendices. However, in the case of the Climate and Air Quality, Economic and Social Conditions, and Land Use components, additional supportive methodological data in the form of Technical Supplements were deemed desirable. These Technical Supplements provide additional information for the reader who wishes to examine a particular environmental component in greater detail than is available in either the summary document or the study document itself.

In addition, a Technical Report describing Coal Related Impacts to the Ft. Berthold Reservation has been prepared. This document, prepared at the request of the North Dakota Indian Affairs Commission, examines the impact of proposed energy developments upon the Ft. Berthold Reservation exclusively.

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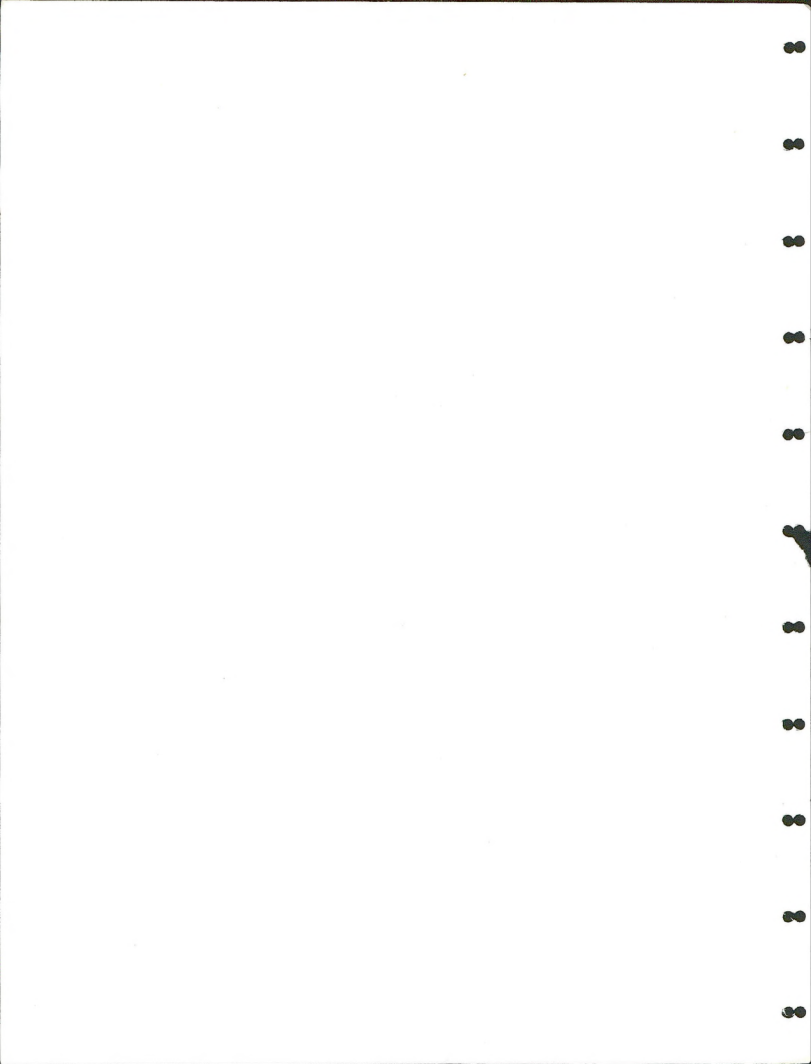
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Economic and Social Conditions Technical Supplement  
Land Use Technical Supplement and  
Coal Related Impacts to the Ft. Berthold Reservation

are available on request from:

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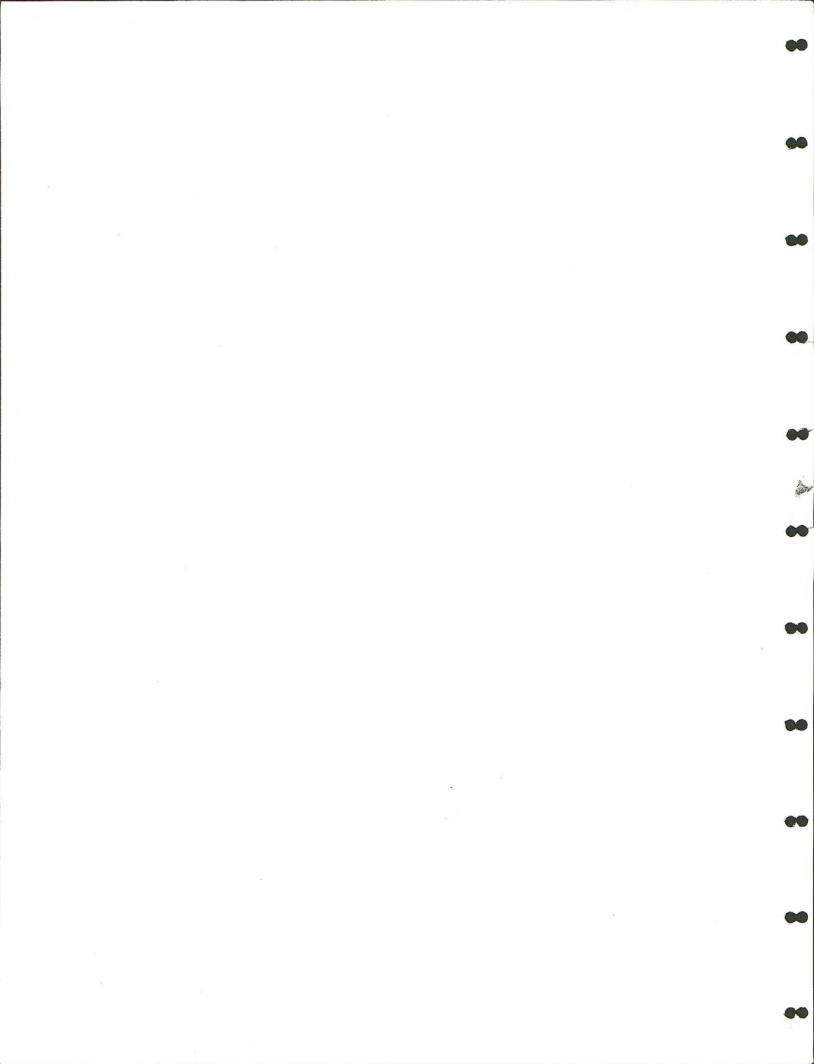
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## TABLE OF CONTENTS

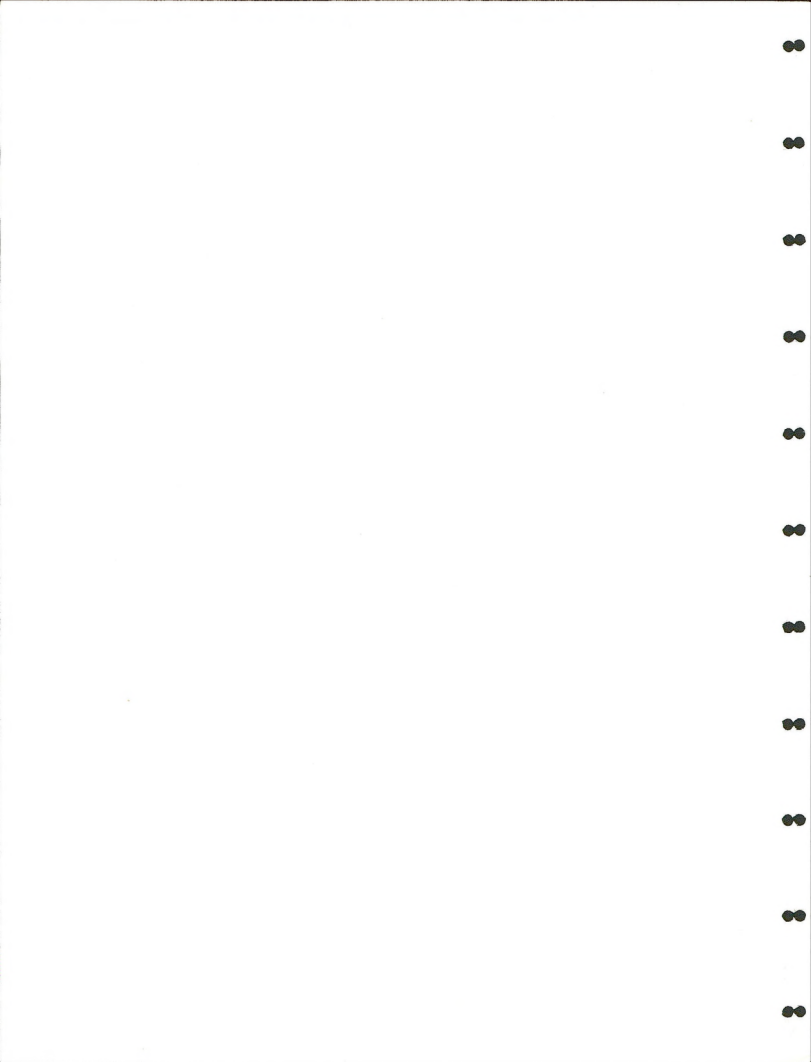
	PAGE
LIST OF TABLES	iii
LIST OF MAPS	v
LIST OF FIGURES	vi
INTRODUCTION	1
HISTORICAL OVERVIEW	6
DESCRIPTION OF PROPOSED AND POSSIBLE FUTURE ACTIONS	7
CLIMATE AND AIR QUALITY	13
GEOLOGY	36
SOILS	43
VEGETATION	47
WATER RESOURCES	50
ANIMALS	62
PRE-HISTORIC AND HISTORIC FEATURES	65
AESTHETICS	69
RECREATION	74
ECONOMIC CONDITIONS	86
SOCIAL CONDITIONS	103
LAND USE	136
SUMMARY	145
APPENDICES	147
STATUS OF FT. BERTHOLD EXTERIOR BOUNDARIES	148
RESOLUTION REQUESTING INDIAN TECHNICAL REPORT PREPARATION	149
CORRESPONDENCE FROM GOVERNOR LINK REGARDING REGIONAL EIS	150
REFERENCES	151
ACKNOWLEDGMENTS	152



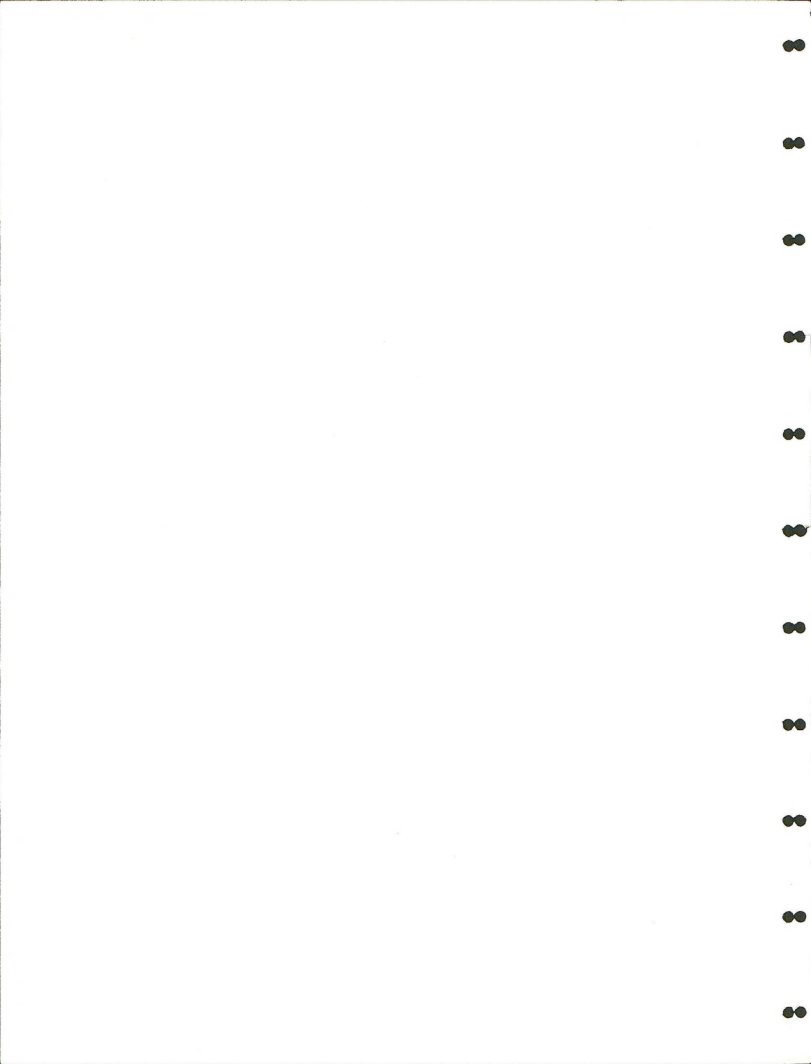
# LIST OF TABLES

TABLE	PAGE
1 Federal Primary and Secondary Air Quality Standards	15
2 Projected Maximum Short-Term Air Contaminant Impacts upon Fort Berthold Reservation, Level 1 Projects	23
3 Projected Short-Term Air Contaminant Impacts upon Fort Berthold Reservation, Level 2 Projects	30
4 Summary of Groundwater Data within Undiminished Boundaries Ft. Berthold Indian Reservation	53
5 Total Surface Water Resources, Ft. Berthold Reservation	55
6 Water Permits on File with the State of North Dakota (Within Reservation Boundary Including Homestead Area)	57
7 Ft. Berthold Indian Population by Age Group	89
8 Type of Income of Families in 1969: North Dakota Indians, North Dakota, and United States	89
9 Farm Income derived from Reservation Land	90
10 Classification of Reservation Programs and Fiscal 75-76 Funding	91
11 Classification and Uses of Indian Land	93
12 Residence Preference	94
13 Death Rate per 1,000 Population by Age: North Dakota Indians 1965-1976 and United States 1966	104
14 Ft. Berthold Indian Population - Births and Deaths	105
15 Age Distribution of Indian Population on the Ft. Berthold Reservation	106
16 Leading Causes of Death on the Ft. Berthold Reservation by Age	106
17 Leading Health Problems on the Ft. Berthold Reservation	106
18 Indian Law Violations on Ft. Berthold - 1975	112
19 The Thirteen Major Federal Crimes	114
20 Educational Attainment of Population 25 Years Old and Over in 1970: North Dakota Indians, North Dakota, and United States	118
21 Housing Distribution by Community, Ft. Berthold Reservation	122





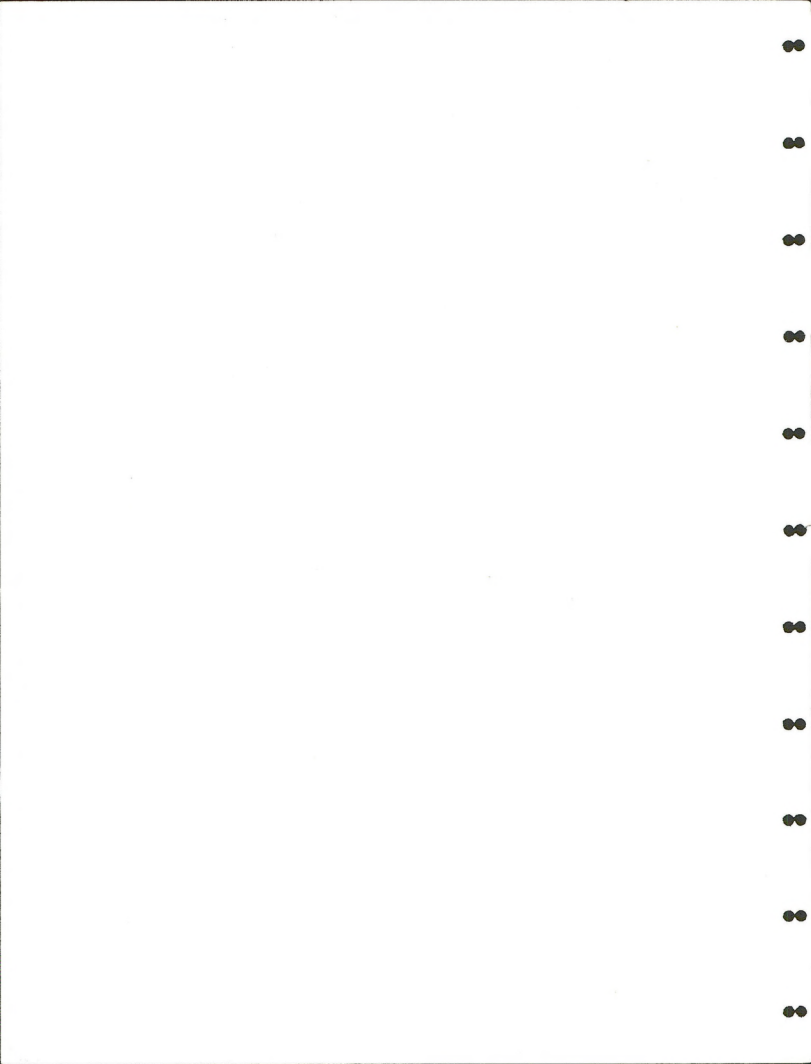
22	Churches or Church Facilities on the Ft. Berthold Reservation	123
23	Farmland Use, Ft. Berthold Indian Reservation (Excluding the Homestead Area)	138
24	Land Ownership, Ft. Berthold Indian Reservation	142





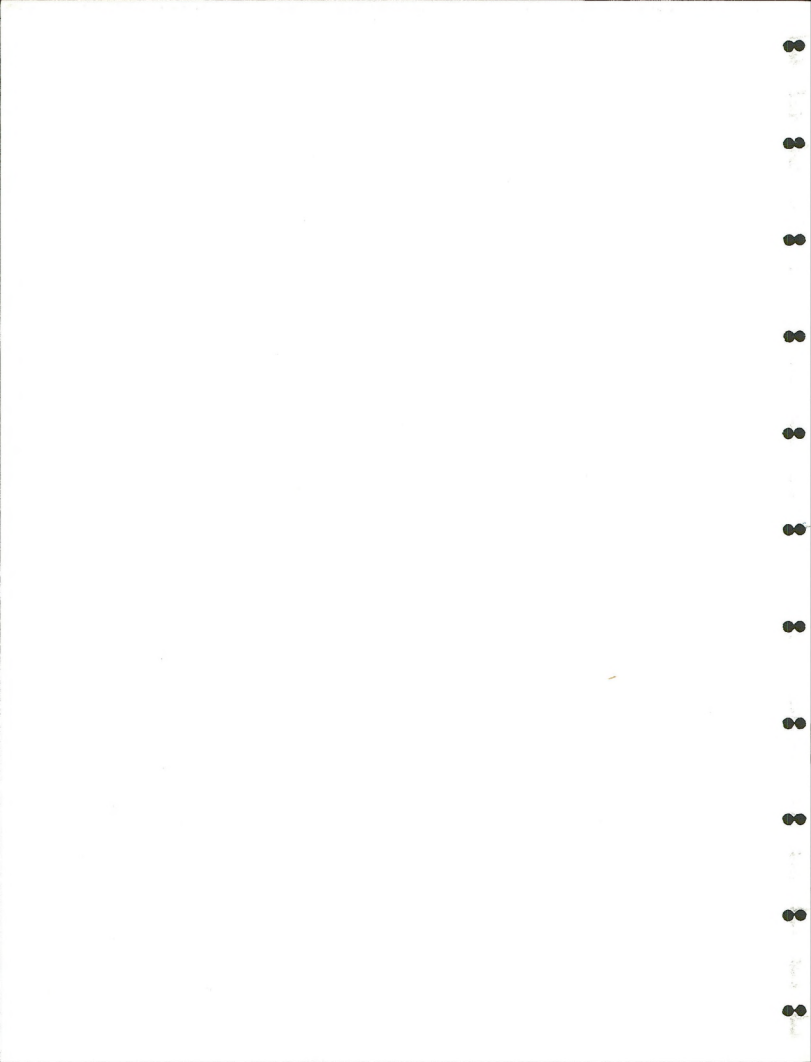
# LIST OF MAPS

MAP	PAGE
1 West-Central North Dakota Study Area	3
2 Ft. Berthold Reservation as it relates to the Seven County Study Area	17
3 Projected Annual Suspended Particulate Concentrations from Major Existing and Proposed Sources	18
4 Projected Annual Concentrations of Sulfur Dioxide from all Major Existing and Proposed Sources	19
5 Projected Annual Concentrations of Nitrogen Dioxide from all Major Existing and Proposed Sources	20
6 Projected Annual Suspended Particulate Concentrations from Major Existing and Proposed Sources - Level 2	25
7 Projected Annual Concentrations of Sulfur Dioxide from all Major Existing and Proposed Sources - Level 2	26
8 Projected Annual Concentrations of Nitrogen Dioxide from all Major Existing and Proposed Sources - Level 2	27
9 Generalized Geologic Map of the Ft. Berthold Indian Reservation	40
10 Level 3 Development Areas	131
11 General Land Use Map, Ft. Berthold Indian Reservation	139



# LIST OF FIGURES

FIGURE		PAGE
1	Williston Basin Showing Location of Ft. Berthold Indian Reservation	39
2-4	Ft. Berthold Reservation Scenic Attractions	75
5-6	Lake Sakakawea Recreation	76
7-9	Four Bears Recreational Complex	78
10-11	Indian Rodeos and Ceremonial Events	79
12	Public Health Service Clinical Outpost, Mandaree	107
13	The Extended Family	110
14	Tribal Court and Law Enforcement Headquarters, Mandaree	113
15	Mandaree School	116
16	Low Rental and Mutual-help Type Housing, Mandaree	120
17	Older Housing, Twin Buttes	120
18-19	Cultural Identity	124
20	Ft. Berthold Powwow	125



## INTRODUCTION

In January 1975, the Governor of North Dakota and the State Director of the Bureau of Land Management, U.S. Department of the Interior (USDI), signed a Memorandum of Understanding committing them to cooperation in planning and environmental areas. By the end of 1975, state and federal agencies were faced with a variety of proposals to use coal and water in the western part of the State for energy development.

Proposals under federal jurisdiction were mainly the leasing of federal coal reserves (Bureau of Land Management), sale of water from Lake Sakakawea for industrial use (Bureau of Reclamation), and loans for electric power development (Rural Electrification Administration). Under Section 102 of the National Environmental Policy Act of 1969 (NEPA), every federal agency which proposes an action which may significantly affect the environment must prepare a statement describing the environmental impact of that action. However, development proposals in western North Dakota involved such a complex of federal, state, and local actions that separate attention to federal actions was both unrealistic and impractical.

With the support of the Assistant Secretary of the Interior, BLM and Bureau of Reclamation officials met with the Governor and key state personnel to discuss the possibility of a joint effort to study coal development impacts. Both the Governor and agency officials shared a concern that the study address cumulative impacts on a regional basis. They felt that this would allow decisions to be made with a clearer understanding of the implications of individual actions for the region as a whole.

Subsequent discussions between the Governor and the Secretary of the Interior, coupled with additional planning at the agency level, led to the

adoption in April 1976 of a plan for a joint "Federal-State Environmental Impact Statement\* on Energy Development in West-Central North Dakota." The plan called for: (1) The National Environmental Policy Act requirements to be the basis for the analysis; (2) The Bureau of Land Management to be the lead federal agency; (3) Addressing the jurisdictional concerns of all involved federal, state, and local agencies; and (4) Early documentation of citizen concerns with potential coal development impacts with a strong commitment to emphasize these areas in the impact analysis. The EIS Manager was to report jointly to the Governor and to the BLM State Director, with periodic direction from an interagency Review Group representing principal state and federal agencies. Participation by the State of North Dakota was substantially increased through a grant from the Old West Regional Commission.

A seven county region in the western part of North Dakota was agreed upon as the Regional EIS study area (Map 1).

A number of factors influenced the selection of the study area, including the location of firm development proposals, actions pending before local, state and federal agencies, coal leasing interest expressed by industry in 1976, and the Governor's concern that additional counties of potentially heavy social and economic impact be incorporated.

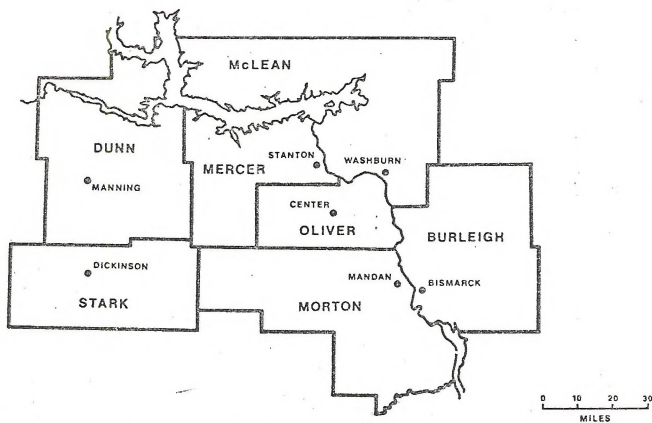
The study area sets boundaries within which proposed actions were identified and addressed. However, impacts from these actions have been studied beyond the region, as have some support facilities such as pipelines and transmission lines.

During June 1976, seven meetings were held in West-Central North Dakota to discuss the Regional EIS and document public concerns and potential impacts accruing from accelerated coal and energy facility development. Sponsored by

\*As a result of litigation involving federal coal policy, the effort was changed from an environmental impact statement to a study (EIS).

Map 1

WEST-CENTRAL NORTH DAKOTA STUDY AREA



SOURCE: Regional Environmental Impact Study.



the Soil Conservation Districts, the meetings resulted in a booklet on "Public Concerns" and reiteration of the commitment that these concerns would be addressed in the EIS.

The Regional EIS reflects two types of analyses: (1) regional and (2) project or site-specific. Volume 1 "Regional Analysis" addresses cumulative impacts of proposed site-specific developments plus other projected regional coal development. The format of this volume emphasizes the regional character of types of proposed activity, such as gasification plants, coal mines, and transmission lines, as they would affect the region on an aggregate basis.

Volumes 2 and 3 (in preparation) are project-specific analyses (EISs) on proposed actions by Natural Gas Pipeline Company of America (Dunn Center Gasification Plant Complex) and Consolidation Coal Company (Glenharold Mine Expansion). Three other project-specific EISs, not directly connected with the Regional EIS, have been prepared on proposed developments within the region. These deal with (1) Basin Electric's Antelope Valley Station; (2) ANG Coal Gasification Company's Gasification Complex; and (3) Montana-Dakota Utilities Coyote 1 Station, all proposed for Mercer County. The "Regional Analysis" was developed in part by evaluating and aggregating information from these site-specific EISs. The specific EISs therefore deal with individual projects as entities, while the Regional Analysis deals with the regional implications of types of activity across project lines.

In addition, some Interagency Work Groups on the Regional EIS have prepared Technical Supplements on the regional implications of the proposed energy activities for its area of environmental concern. These reports provide in greater detail both the baseline information and impact analysis reflected in the "Regional Analysis." They are available to anyone interested in more detailed information, but they are not a part of the Regional EIS for purposes

of public review. They were developed primarily to provide more scientific insight into the analyses performed in the Regional EIS and make available Regional EIS information in a format more readily usable by groups and agencies with specialized scientific interests.

In June of 1977 the North Dakota Indian Affairs Commission (NDIAC) passed a resolution requesting a separate document on Indian concerns in the impact statement. The resolution was signed by Governor Arthur A. Link who is Chairman of the NDIAC (see Appendices, p. 149).

This technical report supplements the West-Central North Dakota Regional Environmental Impact Study (EIS) which addresses coal related impacts to a seven county area in west-central North Dakota resulting from nine mines, three electrical generating plants and two gasification plants; all of which are proposed for construction in that area within the next twenty years. The impact study does not address any energy development on the reservation. Reservation minerals are owned by individual Indians and the Three Affiliated Tribes. There are some non-Indians who own minerals on the reservation. The Three Affiliated Tribes have currently placed a moratorium on all coal leasing or development on the reservation.

Because three of the counties addressed in the study lie partially within the boundaries of the reservation and the reservation lies in such close proximity to the proposed development and because the Three Affiliated Tribes are an autonomous unit of government, the discussion of impacts to the Ft. Berthold Reservation as a result of nearby intensive "off-reservation" development will appear in their entirety in the following report.

This report was prepared by the North Dakota Regional Environmental Impact Study Office and the Bureau of Land Management cooperatively with primary efforts contributed by the North Dakota Indian Affairs Commission Office for the convenience of all parties interested solely in Indian impacts.

Portions of this report may appear in whole or in part in the regional and site-specific impact studies addressing seven county impacts which this report supplements.

#### HISTORICAL OVERVIEW

The Ft. Berthold Indian Reservation, lying in west-central North Dakota, is the home of the Mandans, the Arikara, and the Hidatsa now known collectively as the Three Affiliated Tribes.

The reservation proper encompasses approximately 46,000 acres of a five-county area. These counties are McLean, Mountrail, Dunn, Mercer, and McKenzie.

The Ft. Berthold Indian Reservation was established in 1851 and once encompassed an area along the Missouri River to as far south as the Black Hills. It was reduced in size several times through a series of treaties and executive orders, the last of which occurred in 1910 when a large portion of the Reservation was opened to homesteaders. According to a 1972 Federal Appeals Court ruling (City of New Town vs the U.S. Department of Interior 454F2 121 8th Cir) the homesteaded portion of the reservation is in actuality still within the boundaries of the reservation. That is to say, that the original boundaries of the reservation were never reduced after the area was homesteaded. This portion of the reservation is now commonly referred to as the "homestead area" and that portion of the reservation remaining after the homestead area is deducted is referred to as the "diminished reservation."\*

The latest reduction of reservation lands came in 1955 with the inundation of nearly a fifth of the total reservation area by the waters of the Garrison Reservoir. The effects of the Garrison project upon the culture and the economy of the Three Affiliated Tribes were devastating. Nearly 90 percent of the reservation population was forced to relocate. Many Indian communities were destroyed and rebuilding has been a slow and painstaking process.

\*See appendices, p. 148.

The reservation is an area relatively isolated from large population, manufacturing, and marketing centers. Agriculture is the primary sector of the reservation economy.

The Three Affiliated Tribes were incorporated as a governing body under the Indian Reorganization Act of 1934. Membership of the corporation includes all the enrolled members of the Three Affiliated Tribes. They have been granted all the powers of sovereignty of a quasi sovereign nation with the exception of those restrictions placed upon them by the federal government.

The Three Affiliated Tribes have a constitution and tribal codes by which they govern themselves. Government is conducted democratically through an eleven member tribal council, including a chairperson, all of whom are elected at-large for staggered terms.

## DESCRIPTION OF PROPOSED AND POSSIBLE FUTURE ACTIONS

### INTRODUCTION

The actions addressed in the Regional EIS are mainly industry proposals to use coal and water to produce energy, either electrical or synthetic natural gas. Many of these proposals were already before government agencies for action prior to the start of the EIS. The North Dakota Water Commission, for instance, had already issued conditional permits to Basin Electric, Montana-Dakota Utilities, and ANG Coal Gasification Company for their projects.

In June 1976 all companies thought to be interested in North Dakota coal development were invited to a meeting in Bismarck chaired by the Governor and the Bureau of Land Management (BLM) State Director. Industry officials were asked to submit any project plans they had for the next 10 years for inclusion in the Regional EIS. It was explained that firmness of the proposal and completeness of project plans would determine how proposals were addressed in the EIS. Eleven proposals were submitted, including those already pending.

Broken out by their major components, the project proposals include:

- 9 Coal mines, new (7) or extended (2)
- 3 Electric power plants
- 2 Coal gasification plants
- 1-2 Major new gas pipelines
- 2 Major new transmission corridors

Various support developments

Also, in January 1976, the Secretary of the Interior announced a new federal coal program, calling for industry and public nominations of coal interest or restriction areas. Based on identified industry interest, areas of public and state concern, and a thorough resource planning process, Federal Coal Study Areas (tracts) were identified for coal leasing and development. Thus, these proposed tracts became government proposed actions, as opposed to industry proposals, for the purpose of the Regional EIS. However, it should be noted that at the present time, the U.S. Interior Department is enjoined from further leasing of federal coal which does not meet very strict short term demand criteria. Any renewal of a longer term federal coal leasing program within the identified Federal Coal Study Areas must await completion of an environmental impact statement on the federal coal program.

Because federal coal is leased competitively, there is no assurance that federal tracts offered for lease would support exactly those industry proposals addressed in the Regional EIS. For this reason, separate attention is given throughout the EIS to the impacts from mining federal tracts, particularly where the federal coal proposals differ from present industry plans.

#### LEVELS OF PROPOSED ACTIONS

The proposed actions in the Regional Analysis are described and analyzed by level of development. The levels were developed based on the completeness of industry plans submitted to the Regional EIS Office.



Level 1 consists of five major company proposals, each of which was already proposed and under consideration by one or more agencies at the time the Regional EIS was begun. The project proposals are:

1. Montana-Dakota Utilities Company: A 440 megawatt electric power plant which would be located four miles southwest of Beulah, North Dakota. The Coyote 1 plant would use 2.2 million tons of coal each year from the existing Knife River Coal Company South Beulah Mine. Electricity would be transmitted by a new 345 kv power line to Center, North Dakota and by upgrading one 230 kv line to a 345 kv line to the Fargo, North Dakota area and tying into an existing 115 kv line. The plant would use 11,000 acre-feet of water annually from the Missouri River, obtained by intake structure and a 21-mile, 36-inch diameter pipeline. The Coyote Station is designed primarily to accomodate anticipated demand growth in the North Dakota-Minnesota area.

2. ANG Coal Gasification Company: A 275 million standard cubic feet per day synthetic natural gas plant to be constructed in two phases would be located seven miles north, northwest of Beulah, North Dakota. The plant would use 9.4 million tons of coal each year. All coal for this project and for the Basin Electric Power Cooperative's Antelope Valley Station would be provided by a new 14.6 million tons per year mine belonging to Coteau Properties, a wholly owned subsidiary of the North American Coal Company. Some 17,000 acre-feet of water per year from Lake Sakakawea would be used. American Natural Resources Company, ANG's parent company, markets natural gas throughout the central United States. ANG gas would primarily supply ANR customers in the Michigan-Wisconsin area. Tie-in with ANR's present distribution system would require a 365-mile, 20-inch diameter pipeline to Thief River Falls, Minnesota.

3. Basin Electric Power Cooperative: Basin Electric proposes two 438 megawatt Antelope Valley electric power units to be located seven miles north, northwest of Beulah, North Dakota. The plant would use 5.2 million tons of coal per year from the Coteau Properties Mine mentioned above. Electricity

would be transmitted by two new 345 kv lines running 25 miles from the project site to Stanton, North Dakota, and a single new 500 kv power line to Huron, South Dakota, a distance of 275 miles. Water requirements would be 11,300 acre-feet per year from Lake Sakakawea. Basin plans to share water facilities with ANG and is committed to supplying 135 megawatts of power to the ANG plant. Basin Electric is a consumer owned power cooperative supplying electricity to customers in upper midwest. The purpose of Antelope Valley Station Units 1 and 2 would be to meet projected demand growth in the Basin Electric member system in the Dakotas, Minnesota, and Iowa.

4. Natural Gas Pipeline Company of America: A 275 mmscf per day synthetic natural gas plant would be located in Dunn County. The plant would use 13.9 million tons of coal per year from a new AMAX Coal Company mine in the project area. In addition, the project would use 11,750 acre-feet of water per year involving a 24-mile, 28-inch diameter water pipeline and intake structure at Lake Sakakawea. The gas from the plant is largely earmarked for Peoples Gas Company customers, mainly residential, in the greater Chicago area. NGPL proposes to use the planned Northern Border Pipeline for gas transmission, with a possible 600-mile, 30-inch diameter new line to NGPL compressor station 107 near Emerson, Iowa, where the line would tie in with existing distribution systems as an alternate transmission route.

5. Consolidation Coal Company: Consol proposes to continue operation of its existing 3.8 million tons per year Glenharold Mine near Stanton through acquisition of additional federal leases and mining permits. Almost all production from the mine goes to the new Basin Electric 440 megawatt Leland Olds electric power plant. Contract commitments could necessitate development of an equivalent coal supply elsewhere in the region plus transport facilities should the present operation not continue. The Leland Olds plants supplies electricity to the Basin Electric member system in the Dakotas, Minnesota, and Iowa.

Level 1 of the Regional Analysis, however, deals only with the cumulative environmental consequences for the study area should all of these projects be approved. Projects are not treated individually, except in pointing out certain unique features, or in comparing projects or coal tracts within the study area. Each of these proposals is addressed in a project-specific environmental impact statement which does treat the project as an entity (see Preface).

Level 2 consists of five additional mine proposals, and the proposed 440 megawatt Coyote 2 power plant in addition to the Level 1 proposals. In general, the additional proposals included are less specific than those in Level 1 and are scheduled for later startup dates (1985-90). No applications are presently pending before government agencies on any of the proposals and any federal actions required would involve further site-specific environmental study. More intensive review would also be required by permitting State and local agencies. However, Level 2 represents a best estimate of what development is presently being considered beyond what is addressed in Level 1. In addition, those Federal Coal Study Areas which have been selected for future leasing consideration and have not been included in Level 1 will be analyzed in Level 2.

Level 2 proposals include:

1. Consolidation Coal Company: Renners Cove Mine, 11 miles north of Beulah.
2. Consolidation Coal Company: Washburn Mine, near Underwood.
3. Nokota Company: one mine about 3 miles north of Garrison.
4. Consolidation Coal Company: Dakota Star Mine, 5 miles north of Hazen.
5. Consolidation Coal Company: Underwood Mine, one mile northwest of Underwood.



6. Montana-Dakota Utilities Company: Coyote 2 Station, a 440 mw generating plant at the site of the Coyote 1 Station (see Level 1), with the coal supply also from the existing South Beulah Mine.

Level 2 emphasizes how this additional impact would affect the total for the region.

Level 3 is not actually a level of development. It is an area of potential future coal development beyond 1990 and outside the boundaries of projects or lease proposals in Levels 1 and 2. The area was identified using coal information from U.S.G.S. and from Bureau of Land Management resource planning information. It is analyzed almost exclusively from a view of physical impacts anticipated should future coal development occur, since no firm proposals exist for these areas. The additive process, as used between Levels 1 and 2, is not feasible for addressing Level 3, although development in this larger region could have an additive effect. Level 3 focuses on comparative values between the areas identified for potential future development and those for which specific proposals, both industry and government, have been made.

A discussion of the cumulative impacts on the Ft. Berthold Reservation resulting from the preceding proposed action will appear in the following text by environmental component. Also included will be a discussion of mitigating measures, loss of long-term productivity and irretrievable resource commitments.

## CLIMATE AND AIR QUALITY

### BASELINE INFORMATION

This section of the analysis was prepared by the environmental engineering section of the North Dakota State Department of Health in consultation with the Bureau of Indian Affairs Aberdeen Area Office.

The analysis was completed using what limited existing data available on the air quality of the Ft. Berthold Reservation. The analysis was also drawn on the basis of two assumptions: (1) that only federal ambient air quality standards are applicable to air quality within the boundaries of the Ft. Berthold Reservation and (2) that Class II criteria for total significant deterioration of air quality would continue to be the federal designation for the reservation in the future.

It may be possible that both assumptions could be changed either before, during, or after development has taken place. This would depend largely on future decisions made by the Three Affiliated Tribes regarding energy or industrial development on the reservation, and on Indian attitudes toward impacts that are observed on off-reservation projects.

Although federal ambient air quality standards will always be applicable to the reservation, there appears to be no language in the Federal Clean Air Act which would specifically prohibit an Indian tribe from promulgating its own more stringent air quality standards such as states now do. Although there has been no recorded attempt by an Indian tribe to do this, it is believed to be possible.

The Ft. Berthold Reservation lies within the northern portion of the seven county study area. The air quality characteristics of the reservation are the same as those in the northwestern portion of the seven county study area where there is presently little direct influence of industrial point sources of air contaminants. The climate within the reservation area is also

essentially the same as that of the seven county study area which lies to the south and east of the reservation boundary.

Only Federal Ambient Air Quality Standards are applicable to the air quality within the boundaries of the Ft. Berthold Reservation. The air contaminants, their averaging times, and the existing primary and secondary maximum permissible concentrations are presented in Table 1. North Dakota Ambient Air Quality Standards do not apply to the air quality or air contaminant sources within the jurisdictional boundaries of the Ft. Berthold Reservation.

The major sources of ambient air contaminants influencing the air quality of the Ft. Berthold Reservation at the present time are primarily area sources. No major point sources of ambient air contaminants currently exist within the reservation boundaries. The area sources include highway vehicle traffic, both on and off paved roads, agriculture and related activities, construction, open burning, and the utilization of natural gas, distillate oils and lignite coal. At this time, no data exists on the quantity of ambient air contaminants contributed to reservation air from these area sources.

An air quality monitoring station was established on the Ft. Berthold Reservation at the community of Mandaree in 1976 by the North Dakota Department of Health in cooperation with the Regional Environmental Assessment Program (REAP), and the Bureau of Indian Affairs (BIA). The monitoring station has been in operation for less than one year and only limited data is available on the existing air quality as measured within the reservation boundaries.

Air quality monitoring data for total suspended particulate matter (TSP) collected from September of 1976 through March of 1977 indicates an annual geometric mean concentration of 17 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ). This concentration is less than the Primary Federal Ambient Air Quality Standard of 75 micrograms per cubic meter of air as a maximum allowable concentration.

Table 1

## FEDERAL PRIMARY AND SECONDARY AIR QUALITY STANDARDS

Air Contaminant	Averaging Time	Federal Primary Standard	Federal Secondary Standard
Nitrogen Dioxide <sup>1/</sup>	Annual Average	0.05 ppm (100 $\mu\text{g}/\text{m}^3$ )	0.05 ppm <sub>3</sub> (100 $\mu\text{g}/\text{m}^3$ )
Sulfur Dioxide	Annual Average	0.03 ppm (80 $\mu\text{g}/\text{m}^3$ )	---
	24 Hour	0.14 ppm (365 $\mu\text{g}/\text{m}^3$ )	---
	3 Hour	---	0.5 ppm (1300 $\mu\text{g}/\text{m}^3$ )
Suspended Particulate	Annual Geometric Mean	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$
	24 Hour	260 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
Hydrocarbons (Corrected for Methane)	3 Hour 6-9 A.M.	0.24 ppm (160 $\mu\text{g}/\text{m}^3$ )	0.24 ppm <sub>3</sub> (160 $\mu\text{g}/\text{m}^3$ )
Photochemical Oxidants	1 Hour	0.08 ppm (160 $\mu\text{g}/\text{m}^3$ )	0.08 ppm (160 $\mu\text{g}/\text{m}^3$ )
Carbon Monoxide	8 Hour	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1 Hour	35 ppm (40 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )

SOURCE: 38 CFR 25678, September 14, 1973.

NOTE: ppm = parts per million  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
 mg/m<sup>3</sup> = milligrams per cubic meter

Maximum 3-hour concentration between 6-9 A.M.

<sup>1/</sup>Nitrogen dioxide is the only one of the nitrogen oxides considered in the ambient standards.

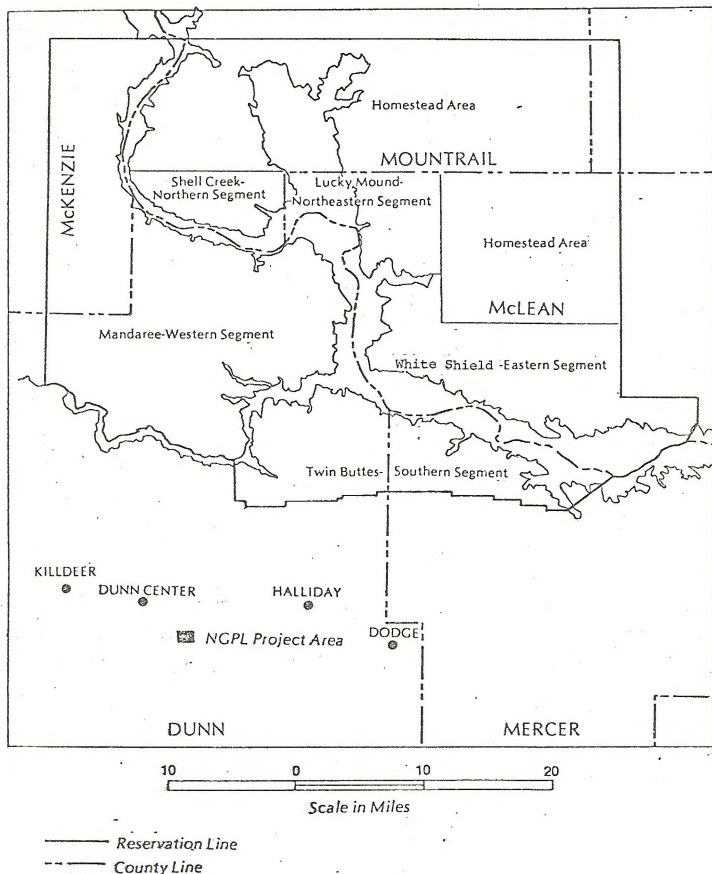
Data collected from September of 1976 through March of 1977 for reactive sulfur indicates an annual arithmetic mean concentration of 0.03 milligrams of sulfur trioxide per one hundred square centimeters per day ( $\text{mg SO}_3/100\text{cm}^2/\text{day}$ ). Even though North Dakota Ambient Air Quality Standards are not applicable, this value is less than the standards for reactive sulfur of 0.25 milligrams sulfur trioxide per one hundred square centimeters per day annual arithmetic mean. The remaining ambient air contaminants as regulated under both the Federal and North Dakota Ambient Air Quality Standards are not being monitored within the Ft. Berthold Reservation boundaries.

### IMPACTS

The portion of the Ft. Berthold Reservation included with the study area is shown in Map 2. The dispersion analysis for particulates, sulfur dioxide, and nitrogen dioxide annual maximum projected concentrations have been presented on Maps 3, 4, and 5 respectively for the proposed Level 1 developments. Even though the total area of the Ft. Berthold Reservation is not shown on these maps, it is an accepted technique in air dispersion modelling to assume that the greater the distance from the emission source, the lower the resulting projected ground level concentrations would be for any air contaminant.

Map 3, presenting the projected annual total suspended particulate ground level concentrations in the study area resulting from the proposed Level 1 developments indicates projected annual particulate concentrations, in the area of the Ft. Berthold Reservation, to be less than 0.6 micrograms per cubic meter of air. The addition of the projected 0.6 micrograms per cubic meter of air to the 25 micrograms per cubic meter of air annual background concentration would cause a negligible impact to the reservation. Therefore, the contribution of particulates from the proposed Level 1 developments should have a minor effect on the air quality on the Ft. Berthold Reservation.

## FORT BERTHOLD INDIAN RESERVATION

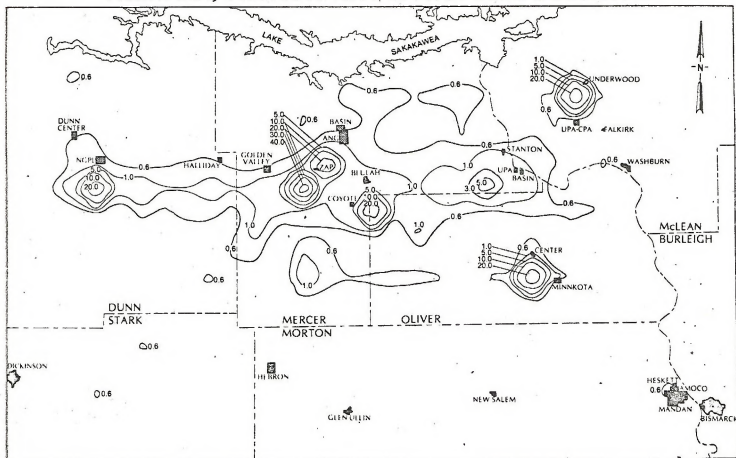


\* SOURCE: Inventory of Water Resources; Fort Berthold Indian Reservation North Dakota 1977



MAP 3

# PROJECTED ANNUAL SUSPENDED PARTICULATE CONCENTRATIONS FROM MAJOR EXISTING AND PROPOSED SOURCES.



Major existing and proposed sources

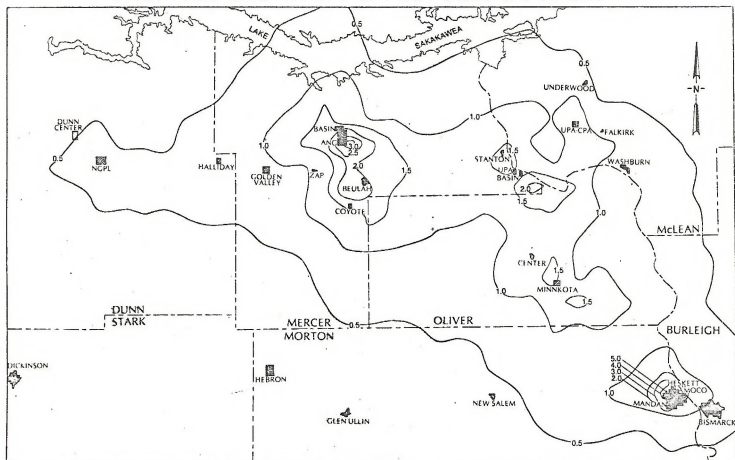
Isolines show total suspended particulate concentrations in micrograms per cubic meter of air

Towns and cities

SOURCE: North Dakota State Department of Health, 1977.

MAP 4

# PROJECTED ANNUAL CONCENTRATIONS OF SULFUR DIOXIDE FROM ALL EXISTING AND PROPOSED SOURCES



Major existing and proposed sources

Isolines show total sulfur dioxide concentrations in micrograms per cubic meter of air

Towns and cities

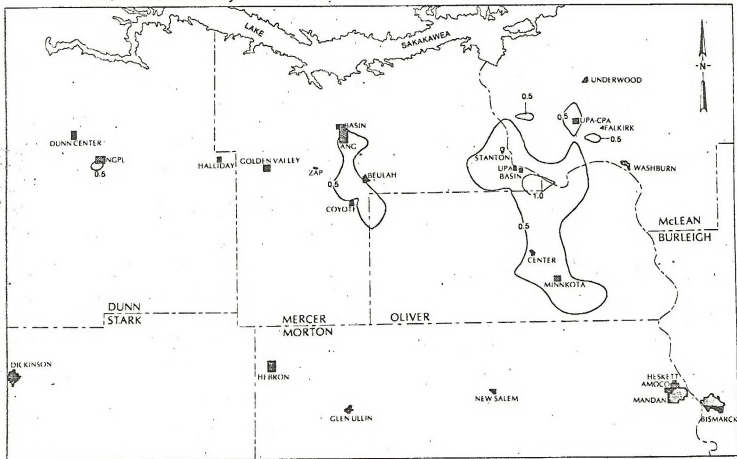
Scale in Miles

SOURCE: North Dakota State Department of Health, 1977.



MAP 5

# PROJECTED ANNUAL CONCENTRATIONS OF NITROGEN DIOXIDE FROM ALL MAJOR EXISTING AND PROPOSED SOURCES



SOURCE: North Dakota State Department of Health, 1977.

As previously mentioned, Map 4 presents the projected annual maximum ground level concentrations for sulfur dioxide in the study area. From a review of this map, it can be observed that the projected ground level concentrations of sulfur dioxide resulting from the Level 1 proposed development would be expected to add less than 1 microgram per cubic meter of air in the area of the Ft. Berthold Reservation; this concentration, when added to an annual background concentration for sulfur dioxide of 5 micrograms per cubic meter of air is considered minor.

Map 5 presents the projected annual maximum ground level concentrations for nitrogen dioxide which would occur in the study area as a result of Level 1 developments. The projected ground level concentration of nitrogen dioxide on the Ft. Berthold Reservation area is less than 0.5 micrograms per cubic meter of air. The addition of this projected ground level concentration to the existing annual background level of 5 micrograms per cubic meter of air would not be measurable using current air quality monitoring technology.

Projected short-term (3-hour and 24-hour) maximum ground level concentrations usually occur in the immediate vicinity of air contaminant emission sources such as the proposed Level 1 developments. The distance from an emission source where maximum short-term ground level concentrations of an air contaminant may occur is dependent upon meteorological conditions such as wind speed, temperature, and atmospheric stability. Under meteorological conditions which give rise to long-range air contaminant transport, some influence upon the air quality within the Ft. Berthold Reservation would be experienced in the short-term. This influence is compared only to the established Federal Ambient Air Quality Standards and the existing Federal Prevention of Significant Deterioration of Air Quality Regulations for a Class II area, since the State of North Dakota does not have jurisdiction on Indian reservations.

Table 2 summarizes the contribution of projected maximum short-term particulate and sulfur dioxide concentrations on the air quality as it exists within the Ft. Berthold Reservation. As presented in Table 2, the maximum short-term (24-hour) projected ground level particulate concentration occurring within the reservation boundaries is 2 micrograms per cubic meter of air as a result of proposed Level 1 development. A comparison of this projected maximum short-term ground level concentration to the Federal 24-hour Prevention of Significant Deterioration of Air Quality Regulations for a Class II area which allows an increment of 30 micrograms per cubic meter of air, shows that proposed Level 1 developments outside the reservation should not significantly impact the air quality of the reservation. For comparison of the projected maximum particulate ground level concentrations with the Federal Ambient Air Quality Standards, the concentration of 2 micrograms per cubic meter of air is added to the existing measured 24-hour background value of 80 micrograms per cubic meter of air. The resulting value, 82 micrograms per cubic meter of air, is less than the maximum allowable 24-hour secondary Federal Ambient Air Quality Standard for particulates of 150 micrograms per cubic meter of air.

The projected short-term (3-hour and 24-hour) maximum ground level concentrations for sulfur dioxide occurring within the Ft. Berthold Reservation boundaries are 84.9 micrograms per cubic meter of air and 34.0 micrograms per cubic meter of air for the 3-hour and 24-hour averaging time periods respectively as a result of the proposed Level 1 developments. The 3-hour projected maximum ground level concentration of sulfur dioxide constitutes 12% of the allowable Federal 3-hour Prevention of Significant Deterioration of Air Quality increment of 700 micrograms per cubic meter of air. The 24-hour projected maximum ground level concentration of sulfur dioxide would be 34% of the allowable Federal 24-hour Prevention of Significant Deterioration of Air Quality Regulation

Table 2

PROJECTED MAXIMUM SHORT-TERM AIR CONTAMINANT IMPACTS UPON FT. BERTHOLD RESERVATION  
 Level 1 Projects  
 (Micrograms Per Cubic Meter of Air)

Total Suspended Particulate			Sulfur Dioxide					
Projected Concentration 24-Hr	Background Concentration 24-Hr	Total Concentration 24-Hr	Projected Concentration		Background Concentration		Total Concentration	
			3-Hr	24-Hr	3-Hr	24-Hr	3-Hr	24-Hr
2	80	2 (82) <sup>2/</sup>	84.9	34.0	35	25	84.9(120.) <sup>2/</sup>	34.0(59.0) <sup>2/</sup>
Standards		30 <sup>3/</sup> 150 <sup>4/</sup>					700 <sup>3/</sup> 1300 <sup>4/</sup>	100 <sup>3/</sup> 365 <sup>5/</sup>

SOURCE: North Dakota State Department of Health 1977

<sup>1/</sup>The maximum ground level concentration was projected to occur at the southern boundary of the Ft. Berthold Reservation. The distance from this boundary to the north boundary of the Basin Electric Complex is eight miles.

<sup>2/</sup>Numbers in parentheses have background added in and are to be compared to Ambient Air Quality Standards. Numbers without parentheses are counted against Prevention of Significant Deterioration of Air Quality increments.

<sup>3/</sup>Prevention of Significant Deterioration of Air Quality increments (Class II).

<sup>4/</sup>Maximum allowable concentrations for Federal Secondary (most stringent) Ambient Air Quality Standards.

<sup>5/</sup>Maximum allowable concentrations for Federal Primary Ambient Air Quality Standards.

increment of 100 micrograms per cubic meter of air. From this analysis it would appear that the influence of the proposed Level 1 development occurring outside of the Ft. Berthold Reservation boundaries should not impact the established Federal Prevention of Significant Deterioration of Air Quality increment for sulfur dioxide to an extent which would restrict potential future industrial development on the reservation.

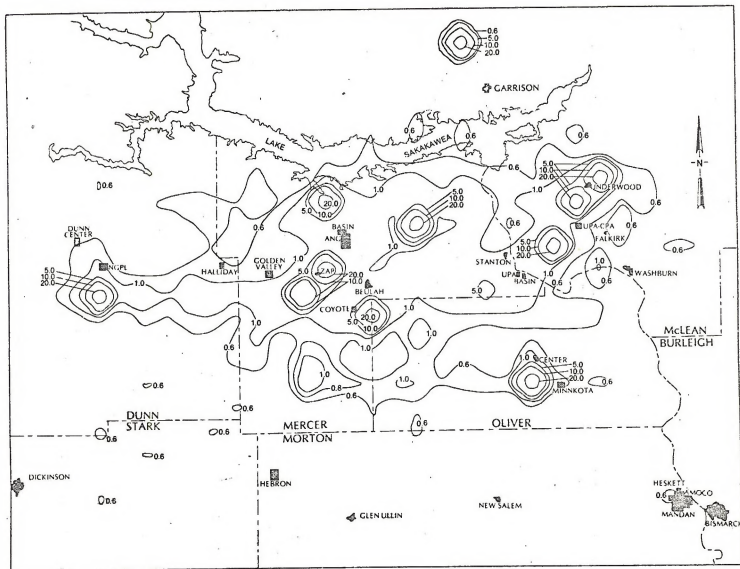
The addition of the existing 3-hour and 24-hour background concentrations for sulfur dioxide in the study area to the maximum 3-hour and 24-hour projected ground level concentrations yield values of  $120 \mu\text{g}/\text{m}^3$  and  $59 \mu\text{g}/\text{m}^3$  respectively. The 120 micrograms per cubic meter of air concentration is less than the maximum allowable 3-hour Federal Secondary Ambient Air Quality Standard of 1300 micrograms per cubic meter of air. The 59 micrograms per cubic meter of air concentration is within the maximum allowable 24-hour Federal Primary Ambient Air Quality Standard of 365 micrograms per cubic meter of air.

All other air contaminants discussed within the study area Level 1 analysis would not be expected to be present in ground level concentrations sufficient to cause adverse environmental impacts. The actual projected concentrations of the various other air contaminant components such as hydrocarbons and photochemical oxidants cannot be formulated since current state of the art air dispersion modelling techniques do not exist for these contaminants. Projected emissions of carbon monoxide, hydrogen sulfide, and hydrocarbons from the proposed Level 1 developments would be small.

The portion of the Ft. Berthold Reservation included within the study area along with the air dispersion analysis for particulates, sulfur dioxide, and nitrogen dioxide showing the annual maximum projected concentrations have been presented in Maps 6, 7, and 8 respectively for the proposed Level 2 energy developments.

MAP 6

# PROJECTED ANNUAL SUSPENDED PARTICULATE CONCENTRATIONS FROM MAJOR AND PROPOSED SOURCES — LEVEL 2



- Major existing and proposed sources
- Isolines show total suspended particulate concentrations in micrograms per cubic meter of air
- Towns and cities

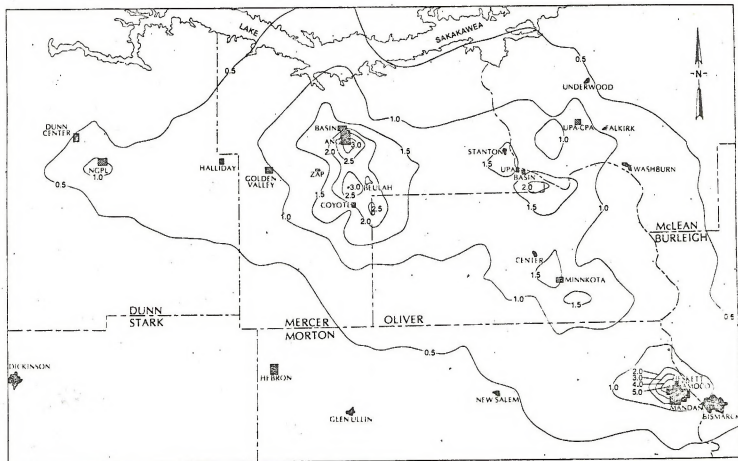
Scale in Miles

SOURCE: North Dakota State Department of Health, 1977.



MAP 7

# PROJECTED ANNUAL CONCENTRATIONS OF SULFUR DIOXIDE ( $\text{SO}_2$ ) FROM ALL EXISTING AND PROPOSED SOURCES — LEVEL 2

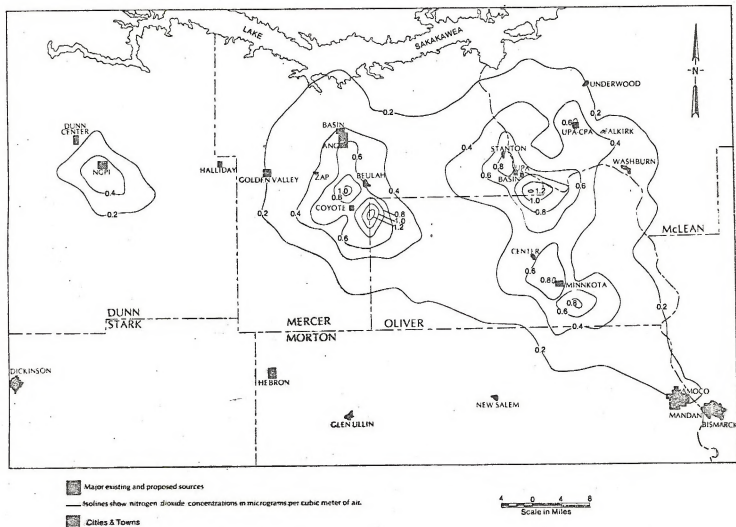


- Major existing and proposed sources
- Isolines show total sulfur dioxide concentrations in micrograms per cubic meter of air
- Towns and cities

SOURCE: North Dakota State Department of Health, 1977.

MAP 8

# PROJECTED ANNUAL CONCENTRATIONS OF NITROGEN DIOXIDE (NO<sub>2</sub>) FROM ALL EXISTING AND PROPOSED SOURCES —LEVEL 2



SOURCE: North Dakota State Department of Health, 1977.



Map 6, presenting the projected annual suspended particulate ground level concentrations in the study area resulting from proposed Level 2 developments indicates projected annual particulate concentrations in the vicinity of Ft. Berthold Reservation to be less than 0.6 micrograms per cubic meter of air. The addition of the projected 0.6 micrograms per cubic meter of air ground level concentration in the Ft. Berthold Reservation area to the 25 micrograms per cubic meter of air annual background concentration would be negligible. Therefore, the contribution of particulates from the proposed Level 2 developments would not be expected to significantly affect the existing air quality on the Ft. Berthold Reservation.

As previously discussed, Map 7 presents the projected annual maximum ground level concentration for sulfur dioxide in the study area. From a review of this map, it can be observed that the projected annual ground level concentration of sulfur dioxide resulting from Level 2 proposed development would be expected to add less than 1 microgram per cubic meter of air to the annual background sulfur dioxide concentration of 5 micrograms per cubic meter of air. This additional ambient air quality concentration of sulfur dioxide within the boundaries of the Ft. Berthold Reservation would not be measurable.

Map 8 has presented the projected annual maximum ground level concentrations for nitrogen dioxide in the study area resulting from the proposed Level 2 developments. The projected ground level concentration of nitrogen dioxide in the Ft. Berthold Reservation area is less than 0.5 micrograms per cubic meter of air. The addition of this projected ground level concentration to the existing annual background level of 5 micrograms per cubic meter of air would not be measurable. All of the projected annual ground level concentrations for particulates, sulfur dioxide and nitrogen dioxide are less than the Federal Primary and Secondary Ambient Air Quality Standards. On the basis of this analysis, no measurable adverse environmental impacts to the air quality on the Ft. Berthold

Reservation would be expected to occur as a result of the proposed Level 2 developments. (North Dakota Air Pollution Control Regulations do not apply on Indian reservations.)

Projected short-term (3-hour and 24-hour) maximum ground level concentrations usually occur in the immediate vicinity of air contaminant emission sources such as the Level 2 development proposals. The distance from an emission source where maximum short-term ground level concentrations of an air contaminant may occur is dependent upon meteorological conditions such as wind speed, temperature, and atmospheric stability. Under meteorological conditions which give rise to long-range air contaminant transport, some influence upon the air quality within the Ft. Berthold Reservation would be expected in the short-term. This influence is compared to the established Federal Ambient Air Quality Standards and the existing Federal Prevention of Significant Deterioration of Air Quality Regulations for a Class II area only, since the State of North Dakota does not have jurisdiction over Indian reservations.

Table 3 summarizes the projected short-term particulate and sulfur dioxide concentration contribution upon the existing air quality within the Ft. Berthold Reservation. As presented in the table, the maximum short-term (24-hour) projected ground level particulate concentrations occurring within the reservation boundaries would be less than 1 microgram per cubic meter of air as a result of proposed Level 2 development. Therefore, a comparison of this projected maximum short-term ground level concentration to the Federal 24-hour Prevention of Significant Deterioration of Air Quality Regulations for a Class II area of 30 micrograms per cubic meter of air increment indicates that proposed Level 2 developments outside of the reservation would not impact the air quality increment established for the reservation.

Table 3

PROJECTED SHORT-TERM AIR CONTAMINANT IMPACTS UPON FT. BERTHOLD RESERVATION  
 Level 2 Projects  
 (Micrograms Per Cubic Meter of Air)

Total Suspended Particulate			Sulfur Dioxide					
Projected Concentration	Background Concentration	Total Concentration	Projected Concentration		Background Concentration		Total Concentration	
24-Hr	24-Hr	24-Hr	3-Hr	24-Hr	3-Hr	24-Hr	3-Hr	24-Hr
2/	80	2/	92.9	37.2	35	25	92.9(127.9) <sup>3/</sup>	37.2(62.2) <sup>3/</sup>
Standards		30 <sup>4/</sup> 150 <sup>5/</sup>					700 <sup>4/</sup> 1300 <sup>5/</sup>	100 <sup>4/</sup> 365 <sup>6/</sup>

SOURCE: North Dakota State Department of Health 1977

1/The maximum ground level concentration was projected to occur at the southern boundary of the Ft. Berthold Reservation. The distance from this boundary to the north boundary of the Basin Electric Complex is eight miles.

2/The short term ground level concentrations projected to occur on the Ft. Berthold Reservation resulting from the projected Level 2 projects were so slight they were considered negligible (less than 1 g/m<sup>3</sup>).

3/Numbers in parentheses have background added in and are to be compared to Ambient Air Quality Standards. Numbers without parentheses are counted against Prevention of Significant Deterioration of Air Quality increments.

4/Prevention of Significant Deterioration of Air Quality increments (Class II).

5/Maximum allowable concentrations for Federal Secondary (most stringent) Ambient Air Quality Standards.

6/Maximum allowable concentrations for Federal Primary Ambient Air Quality Standards.

For comparison of the projected maximum particulate ground level concentrations of the Federal Ambient Air Quality Standards, the concentration is added to the existing measured 24-hour background value of 80 micrograms per cubic meter of air. The resulting value of slightly more than 80 micrograms per cubic meter of air which is essentially the existing background concentration, is less than the maximum allowable 24-hour Secondary Federal Ambient Air Quality Standard of 150 micrograms of particulates per cubic meter of air. From this analysis, no adverse short-term impacts to the air quality would be expected to occur within the Ft. Berthold Reservation boundaries from particulate emissions resulting from the proposed Level 2 development.

The projected short-term (3-hour and 24-hour) maximum ground level concentrations for sulfur dioxide occurring within the Ft. Berthold Reservation boundaries are 92.9 and 37.2 micrograms per cubic meter of air respectively as a result of the proposed Level 2 developments. The 3-hour projected maximum ground level concentration of sulfur dioxide constitutes 13% of the allowable Federal 3-hour Prevention of Significant Deterioration of Air Quality increment of 700 micrograms per cubic meter of air for a Class II area. The 24-hour projected maximum ground level concentration of sulfur dioxide would be 37% of the allowable Federal 24-hour Prevention of Significant Deterioration of Air Quality Regulation increment of 100 micrograms per cubic meter of air for a Class II area.

From this analysis it would appear that the influence of the proposed Level 2 development occurring outside of the Ft. Berthold Reservation boundaries would not impact the established Federal Prevention of Significant Deterioration of Air Quality increment for sulfur dioxide to an extent that would restrict potential future industrial development on the reservation.

The addition of the existing 3-hour and 24-hour background concentrations for sulfur dioxide in the study area to the maximum 3-hour and 24-hour projected ground level concentrations yield values of 127.9 micrograms per cubic meter of air and 62.2 micrograms per cubic meter of air respectively. The 127.9 micrograms per cubic meter of air concentration is less than the maximum allowable 3-hour Federal Secondary Ambient Air Quality Standard of 1300 micrograms per cubic meter of air. The 62.2 micrograms per cubic meter of air concentration is less than the maximum allowable Federal Primary Ambient Air Quality Standard of 365 micrograms per cubic meter of air. On the basis of this comparison, short-term adverse impacts upon the ambient air quality from sulfur dioxide emissions would not be expected to occur within the Ft. Berthold Reservation boundaries as a result of the proposed Level 2 development.

All other air contaminants discussed within the study area Level 1 analysis would not be expected to be present in ground level concentrations sufficient to cause adverse environmental impacts. The actual projected concentrations of the various other air contaminants such as hydrocarbons and photochemical oxidants cannot be formulated since current state of the art air dispersion modelling techniques do not exist for these contaminants. Projected emissions of carbon monoxide, hydrogen sulfide, and hydrocarbons would be small from the proposed Level 1 and Level 2 developments.

The definition of Level 3 proposals outlines that Level 3 is not actually a level of proposed industrial development with identified proposed projects. It is an area of potential future coal development beyond 1990 and outside the boundaries of project proposals in Level 1 and Level 2. Since specific point and area source proposed projects for Level 3 development have not been identified, it is not possible to qualitatively or quantitatively project and discuss potential environmental impacts to the air quality of the Ft. Berthold Reservation as a result of ambient air contaminants for the proposed Level 3 time period.



Indian tribes have been delegated the option through the Federal Clean Air Act to apply for redesignation based on Total Significant Air Deterioration to Class I or Class III. It is possible that the Three Affiliated Tribes might apply for either class designation in the future.

#### MITIGATION

Prevention of Significant Deterioration of Air Quality was one of the major issues addressed in the Clean Air Act Amendments signed into law on August 7, 1977. At the present time, only preliminary regulations have been proposed by the Environmental Protection Agency for implementation of the 1977 Amendments. Federal mitigation would occur through the enforcement of the Federal Prevention of Significant Deterioration of Air Quality regulation for which the U.S. Environmental Protection Agency has responsibility. However, since the full implication of the Amendments have not been defined, it is not possible to project what effects their implementation will have on the air quality within the boundaries of the reservation.

Some state and local measures which are enforced to mitigate air quality deterioration in the seven county study area would in effect also limit air quality deterioration from the proposed action on the reservation.

Another possible measure to mitigate deterioration to reservation air quality would be the promulgation by the Three Affiliated Tribes of more stringent ambient air quality standards for the Ft. Berthold Reservation similar to those of the State of North Dakota. There may be some argument of the legality of such action, but a precedent could be set.

#### RESIDUAL ADVERSE IMPACTS

Concentrations within the study area for all currently regulated ambient air contaminants such as particulates, sulfur dioxide, oxides of nitrogen, reactive sulfur (sulfation), carbon monoxide, hydrocarbons, photochemical oxidants,

and hydrogen sulfide would increase over that which now exists. Although emission control would be imposed for all levels, point source projects and mining activities, as well as vehicular emissions, an increase in contaminant levels in the air would result. This would include at least those portions of the reservation in the seven county study area. The increased concentration of these air contaminants, however, would not be in excess of existing federal air pollution control regulations for maximum permissible ambient air concentrations.

#### SHORT-TERM USE VS LONG-TERM PRODUCTIVITY

Short-term impacts on air quality in the study area from electrical generating units and gasification facilities would be from major emissions such as particulates, sulfur dioxide, and oxides of nitrogen. It would be expected in the short term that the duration of any increases of contaminant concentrations would coincide with the operating life of the emission source. Long term increases of major air contaminants would not be expected to occur. Air pollution resulting from mining activities would be expected to be of a short term nature, occurring only during active mining assuming that land surfaces are reclaimed to pre-existing vegetative cover and original contour. Residual air quality effects after the cessation of mining would depend on the subsequent use of the land. The reservation may experience minor short term impacts in air quality as outlined in the above discussion.

Due to possible short term deterioration of portions of the existing reservation air quality, decisions made by the Three Affiliated Tribes regarding change of classification under the Federal Prevention of Significant Deterioration of Air Quality Regulations may be influenced by impacts experienced in the short term from the proposed action. This could have long term ramifications on the degree of industrial development within and near the reservation, especially if the reservation were redesignated to Class I under Federal Prevention of Significant Deterioration of Air Quality Regulations.

## IRRETRIEVABLE RESOURCE COMMITMENTS

The actions undertaken during all levels of proposed development would not be expected to result in an irretrievable resource commitment of reservation air quality. However, an incremental portion of the existing air quality would be committed through the development and life expectancy of the projects.

## ALTERNATIVES

The no action alternative means the new proposals would be denied and only existing projects and those projects under construction would be allowed to operate. This would mean several of the proposed projects which are to be constructed near the reservation would not occur; thus, impacts to reservation air quality would be negligible.

The no leasing of federal coal alternative would halt the construction of Natural Gas Pipeline and possibly the continued mining at Consolidation Coal Company's Glenharold Mine near Stanton. Since the Natural Gas Pipeline Company project is slated for construction relatively near the reservation, no leasing of federal coal would mean less impacts to the air quality of the reservation because NGPL would not be built.

Alteration of plant construction and operating schedules would improve upon the air quality in the study area. However, these improvements may not be observable or detectable. The alteration of plant construction and operating schedules would not significantly affect ambient air quality in the study area.

Project modifications such as additional emission control systems or relocation of plant sites would have effects on the air quality of the reservation. If a plant is sited closer to the reservation it would probably increase the effects on the air quality. If plants were located farther away or in different directions from the reservation impacts to air quality might be less.



## GEOLOGY

### BASELINE INFORMATION

#### Geological Setting

The Ft. Berthold Reservation is located in the west-central part of North Dakota on the eastern edge of the Williston Basin. The reservation portion of the Williston Basin has been covered by marine seas a number of times throughout geologic time since the Williston Basin began forming in Cambrian time (less than 500 million years ago).

During Paleozoic time (500 to 200 million years ago), this part of the Williston Basin was invaded by marine seas at least four times. Rock types resulting from deposits of the Paleozoic seas include carbonates, sandstones, shales, and evaporites. Emergent periods occurred between the invading seas, during which time part of the deposits were removed by erosion. The emergent periods are reported to have occurred during Early-to-Middle Ordovician, Middle Silurian-to-Middle Devonian, Late Mississippian-to-Early Pennsylvanian, and during the Triassic period of Mesozoic time.

Marine deposition continued until the late Jurassic at which time another emergent period occurred with non-marine deposition. The period of non-marine deposition continued into Early Cretaceous, at which time seas again spread over the area. The Early Cretaceous seas resulted in the deposition of a thick sequence of mud carried by rivers from the adjacent continent into the deepening Williston Basin.

In Late Cretaceous time the sea became shallow and the fine grained clastics of the Fox Hills Formation were deposited. The area then became dryland again as the sea retreated eastward and non-marine deposition began with the deposition of the Hell Creek and then the Ludlow Formations.

In Early Tertiary time the sea again rose and the Cannonball Formation was deposited. The Nesson Anticline in the western part of the reservation and the Rocky Mountains to the west had begun to form during this time period. Later in the Tertiary, the Cannonball Sea receded eastward, resulting in the deposition of the Tongue River, Sentinel Butte, and Golden Valley Formations.

A period of erosion followed the deposition of the Golden Valley Formation resulting in the development of a surface of considerable relief. Erosion was so great in the reservation area that in some places the Golden Valley Formation was completely removed and the Late Tertiary White River Formation was deposited directly on the Early Tertiary Fort Union Formation.

A long period of erosion followed in Late Tertiary time removing most of the White River Formation in the area resulting in a smoothly rolling plain with broad flat valleys and a few high buttes. This surface has been preserved over most of the region except for alterations by rivers and by glacial activity during the Quaternary period.

The reservation area was glaciated a number of times during the Quaternary Period. Before the advance of the earliest glacier, the rivers that drained northeastward from northeastern Montana flowed across Canada and drained into Hudson Bay. The first glacier spread across Canada and reached into the reservation area approximately 3 million years ago. The rivers that had been flowing northeastward were diverted around the southeastern edge of the ice sheet into the Mississippi drainage forming the Missouri River. The last of several glaciations was estimated by the North Dakota Geological Survey to have begun approximately 22,000 years ago. The NDGS reported that it reached the area of New Town approximately 16,000 or 15,000 years ago damming the Missouri and causing a lake to be formed north and west of the present site of Four Bears Bridge. The lake subsequently overflowed the lowest divide south of the present site of Four Bears Bridge forming the modern channel of the Missouri River.

The glacier had melted back and was rapidly downwasting approximately 13,000 years ago. It was covered with a layer of pebbly, sandy, silty clay which acted as an insulating material causing some of the ice to persist until about 8,500 years ago at which time the climate became drier. The dry period, which was reported by the NDGS to be similar to the driest period of the 1930's, ended approximately 4,500 years ago. At that time the climate became similar to that of today. During the past 10,000 years the predominant geologic activity has been erosion, which has caused the lakes in the area to become shallower due to sedimentation.

As previously stated, the reservation is situated on the east flank of the Williston Basin, which is a structural basin containing a thick sequence of sedimentary rocks. Based on data obtained for areas adjacent to the reservation, total thickness of sedimentary rocks within the reservation is estimated to be up to 14,000 feet.

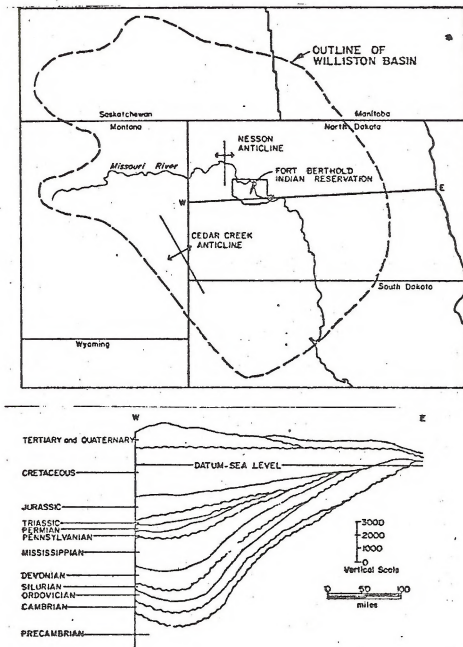
The most significant geologic structures located on or adjacent to the reservation are the Williston Basin, Nesson Anticline, and the Keene Dome (Figure 1 and Map 9). The rocks in the area of the reservation generally dip to the west at low angles ranging from less than 25 feet per mile in the Upper Cretaceous to over 50 feet per mile in the Paleozoic rocks.

#### IMPACTS

One tentative mining proposal of Level 2 (Renner's Cove) is eight miles east of Twin Buttes community and has a common boundary with the southeast edge of Ft. Berthold. The other tentative mine proposals are more than 10 miles away. The topography might be altered and the overburden and coal might be excavated at the Renner's Cove mine to within 20 feet of the Ft. Berthold boundary, but no mining would be done on the reservation. Additional fossils might

Figure 1

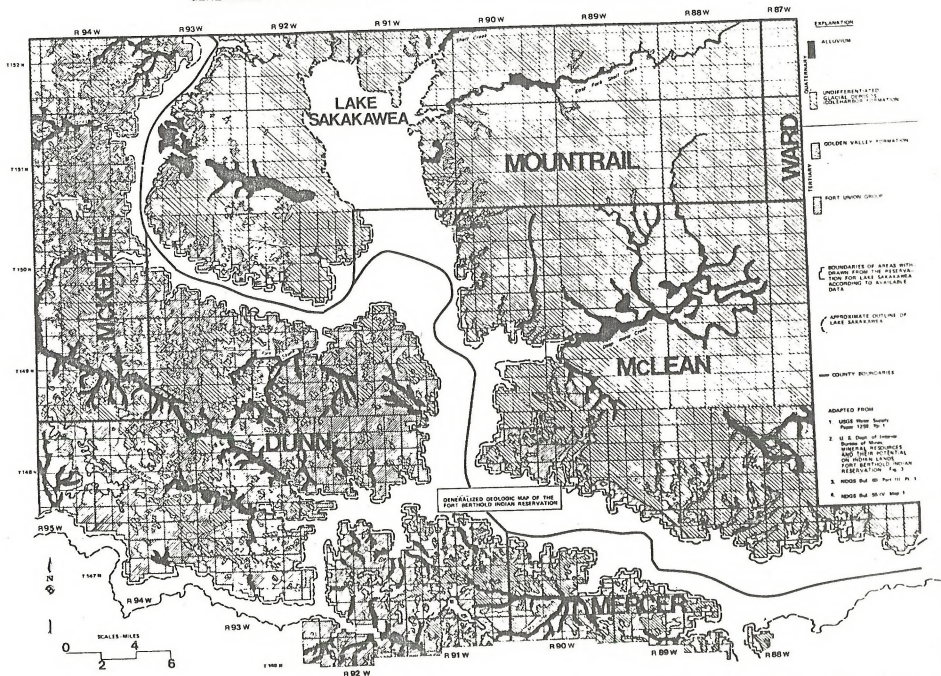
WILLISTON BASIN SHOWING LOCATION OF FT. BERTHOLD INDIAN RESERVATION.  
MAJOR STRUCTURAL FEATURES WITH GENERALIZED NORTH DAKOTA STRATIGRAPHIC  
COLUMN AND CROSS SECTION ACROSS THE STATE



SOURCE: North Dakota Geological Survey Bulletin 60, Part I,  
North Dakota State Water Commission County Groundwater  
Studies 15, Part II.

# GENERALIZED GEOLOGIC MAP OF THE FT. BERTHOLD INDIAN RESERVATION

-40-





be collected by some of the additional people brought to the study area by the Level 2 projects.

Three of the Level 2 areas (Garrison, Hazen-North Beulah, and Dickinson-Dunn) have common boundaries on the east and south sides of Ft. Berthold. The Dickinson-Dunn area is nearly three miles south of the community of Twin Buttes. No coal mining would be permitted on Ft. Berthold by the Level 3 activities, thus no changes in the topography, sedimentary formations, or mineral resources would be expected. Additional fossils might be collected if population is increased as a result of the Level 3 projects.

#### MITIGATION

Since no specific impacts to reservation geology have been identified no special mitigation measures would be required. Should an identifiable impact related to off-reservation mining occur to the reservation geology, mitigation might be necessary.

#### RESIDUAL ADVERSE IMPACTS

No residual adverse impacts to the reservation are expected due to off-reservation coal mining.

#### SHORT TERM USE VS LONG TERM PRODUCTIVITY

Since no short term disturbance of the reservation's geology is expected to occur due to off-reservation development, long term use of the geological resource will not be affected by action addressed in this impact statement.

#### IRRETRIEVABLE RESOURCE COMMITMENTS

No geological resources of the Ft. Berthold Reservation are expected to be committed due to the proposed action.

## ALTERNATIVES

In light of the fact that no geological impacts can be foreseen for the Ft. Berthold Reservation as a result of off-reservation development, the alternative actions are not expected to produce or change impacts to reservation geology.

## SOILS

### BASELINE INFORMATION

The Ft. Berthold Reservation lies in the Chestnut soil zone, a zone characteristic of mixed grass prairie and a semiarid climate. A typical profile of the well-drained uplands of moderate relief has a dark grey-to-brown topsoil 3 to 5 inches thick, a well-defined prismatic subsoil, and a conspicuous accumulation of lime at about 16 inches. As the landscape becomes more rolling and hilly, the soils have thinner and more shallowly developed profiles.

Recent alluvium in most of the bottomlands is too young to have any appreciable profile development. Some of these bottomlands have been affected by excess moisture and salinity. The high salt content of some of the parent materials has contributed to the rise of alkali-claypan soils. The badlands areas are characterized by large areas of rough broken land with little or no soil development.

The soils of the reservation vary considerably from place to place, and the following discussion is therefore broken down according to the way in which the reservation was divided by Lake Sakakawea. The following discussion briefly describes the soil types in each segment of the reservation.

#### Western Segment of the Reservation

The majority of the western segment contains non-arable soils and is suited mainly to livestock grazing. Most of the steep lands, except in the southern area, have thin soils developed from residual materials. Badlands dominate the immediate breaks of the Missouri and Little Missouri Rivers plus the areas near the mouths of their major tributaries. Less dissected, hilly, thin soils occupy the major portion of the remainder, except where the latter is occupied by



undulating divides. These are occupied by deeper glacial and sandstone-derived soils with good agricultural potential. Similar soils are more extensive in the Blue Buttes area between Squaw Creek and Clark Creek, and glacial soils are dominant in the northern portion between Clark Creek and Antelope Creek and the Missouri River.

#### Southern Segment of the Reservation

The southern segment is also dominated by badlands and rough, broken areas with thin soils, suitable for range use. Arable land, largely of glacial origin, occurs on the divides and the plateau remnants farther away from the Missouri and Little Missouri and their breaks. Malnourie Creek and Beaver Creek have broad valleys with deep alluvial soils. These are arable to a large extent.

#### Northern, Northeastern and Eastern Segments of the Reservation

In contrast to the western and southern segments, the remaining three segments are occupied by deep, glaciated soils, mostly under cultivation at the present time. These agricultural lands have fully developed zonal soils and lie on a rather smooth to rolling plain. They are modified in place by outwash deposits and moraine remnants. Hilly and rough broken land with thin soils is confined to a strip of land adjacent to Lake Sakakawea rarely exceeding 1 mile in width. A limited amount of loess-derived soils occurs in the southern portion of the northeastern segment. Colluvial deposits are rather extensive in association with the better upland soils in these segments, especially the eastern one.

## Homestead Area Soils

The dominant soils in the Homestead Area portion of the reservation are the undulating and gently undulating Williams loams and clay loams. These soils are well-drained and were derived from glacial till and occur on short, convex or plane slopes of ground moraines and on moderate slopes of marginal and end moraines. The Williams soils are technically classified as Chestnut soils.

In some areas, notably south of New Town, the Williams association blends into the Williams-Zahl association and, in the rougher areas, to the hilly and steep Zahl association. These well-drained-to-excessively-drained soils were derived from glacial till and occur on convex crests and upper slopes of hills and ridges of marginal and end moraines and on the steep, upper slopes of entrenched stream valleys and drainageways. The Zahl series is technically classified as a regosol.

Both the Williams and Williams-Zahl series are extensively used for the dryland production of small grains and forage crops.

It is estimated that the Williams and Williams-Zahl soils series extend across over 90 percent of the Homestead Area of the reservation. By virtue of their extensiveness, it is seen that these soils are intensively used for this area's primary land use - dryland small grain production. There are numerous other soil types scattered throughout this Homestead Area, most of which are suitable for cultivation. However, there are isolated areas where the soils are not arable due to poor drainage, steep slopes or other factors.

## IMPACTS

No soil impacts from Level 1, Level 2, or Level 3 proposed actions are anticipated for the Ft. Berthold Reservation.

#### MITIGATION

Since no impacts to the soils of the Ft. Berthold Reservation have been identified, no mitigation is deemed necessary at present.

#### RESIDUAL ADVERSE IMPACTS

Since no impacts to soils of the Ft. Berthold Reservation have been identified at present there would be no residual adverse impacts.

#### SHORT TERM USE VS LONG TERM PRODUCTIVITY

Since there will be no short term disruption of soils on the reservation due to the proposed action there will be no effect on long term productivity.

#### IRRETRIEVABLE RESOURCE COMMITMENTS

Since there will be no impacts to the soils of the Ft. Berthold Reservation there are no expected irretrievable resource commitments.

#### ALTERNATIVES

Because there are no impacts expected to the soils environment of the reservation, none of the alternatives would affect the soils on the reservation.

## VEGETATION

### BASELINE INFORMATION

The grasslands of the diminished reservation comprise one of the area's most abundant and important resources. About 75 percent of the native vegetation on the diminished reservation is grass. Drainage channels are fairly well-wooded and provide good protection for livestock. The majority of the vegetation is composed of several grasses, namely western wheatgrass, little bluestem, bluegrass, sand reed grass, plains muhly grass, green needlegrass, needle-and-thread, and blue gramma.

The remaining 25 percent of the native vegetation is composed of weeds, shrubs, and trees. Some common species of herbs and small shrubs are green sage-wort, finged sage, and goldenrod. The primary shrub species include juneberry, silver sage, silver buffaloberry, western snowberry, prairie rose, creeping red cedar, dwarf juniper, and chokecherry. The main species of trees are aspen, cottonwood, bur oak, green ash, boxelder, Rocky Mountain juniper, American Elm, and paper birch.

The major portion of the rangeland is in excellent or good condition. It takes about 2-3/4 acres of average rangeland to produce feed to support a cow for one month.

The vegetation on the Ft. Berthold Reservation was not interpreted for inclusion on the vegetation maps in the Regional Analysis as the reservation was not included in the infra-red photography use for the interpretation. However, it is projected that the vegetation on Ft. Berthold is quite similar and exists in similar portions as in northern Dunn County, northwestern Mercer County, and western McLean County.

Production of the various ground cover types is anticipated to be similar to those noted in Chapter 2 of the Regional Analysis for portions of the seven county study area adjoining the reservation.

## IMPACTS

None of the proposed projects occurs on the Ft. Berthold Reservation and no significant impacts to its vegetative resources are anticipated. There is, however, the possibility that impacts to vegetation could occur as a result of deteriorated air quality. Such impacts, if they did occur, would be the result of the volatilization of elemental coal constituents which, when expelled from the stacks and deposited on surrounding land and vegetation, cause toxic reactions in plants. Such reactions could be in the form of triggering a trace element reaction in the soil or directly affecting the plants metabolism through physical contact, either singly or in combination. Examples of potentially toxic constituents are fluorides, sulfur dioxide, and selenium. The North Dakota Department of Health is presently involved in a study entitled, "Trace Element Effects of Energy Conversion Facilities." They have also applied for a \$900,000 grant from the Environmental Protection Agency which is earmarked for the study of the sulfur/selenium balance in the environment and the effect of energy conversion facilities on this balance.

The ANG/Basin Level 1 mining area and the Renner's Cove Level 2 mining area both border the Ft. Berthold Reservation. The only impacts that might occur to vegetation of the Ft. Berthold Reservation are those associated with deteriorated air quality. These possible impacts are not readily predictable or quantifiable at this time.

## MITIGATION

No state or federal measures would be applicable to mitigate possible impacts to vegetation on the reservation since the type of toxic emission considered probably would not violate the Clean Air Act.

The redesignation of the reservation to Class I Air Quality Standards might prevent the construction of the ANG/Basin complex, depending upon the level of control technology the plant employs.

#### RESIDUAL ADVERSE IMPACTS

If the trace element toxicity problem should be noted in reservation vegetation near any of the proposed energy plants it would probably be an impact that could not be mitigated except through the employment of technology that would eliminate toxic levels of trace elements from the stack emissions.

#### SHORT TERM USE VS LONG TERM PRODUCTIVITY

During the short term (life of the project) the vegetation on the reservation could be affected for 25 years. Longer term damage would not be expected to occur unless deposits of those elements already at high levels in the soil were to trigger toxic reaction that would remain after the project has been terminated.

#### IRRETRIEVABLE RESOURCE COMMITMENTS

The loss of products of grazing such as reduced beef and dairy production and other agricultural product bases such as decreased small grains yield due to toxic emissions from energy conversion facilities could be considered irretrievable resource commitments. The extent to which these phenomena might occur, however, is not presently definable.

#### ALTERNATIVES

Project modification (Alternative #4), would be the only alternative which could ensure that damage to reservation vegetation would not occur. If the energy plants were sited a greater distance away from the reservation air emissions drifting over the reservation would be less likely to occur.



## WATER RESOURCES

### BASELINE INFORMATION

Water resources on the Ft. Berthold Reservation are currently being quantified and qualified in a Water Resource Inventory being prepared by the Indian Action Task Force and several consulting firms for the Three Affiliated Tribes. While the report has not yet been completed, initial phases of the document provide information about the water resources on Ft. Berthold and their existing potential for use.

The following are excerpts from the Inventory of Water Resources, Ft. Berthold Indian Reservation, North Dakota, Water Resource Base Phase I.

#### Groundwater

Groundwater within the boundaries of the Ft. Berthold Reservation is obtained mainly from sandstone and lignite aquifers in the preglacial rocks and from sand and gravel aquifers in the glacial deposits. The preglacial rocks of economic importance in the reservation are the Dakota aquifer of the Dakota Group, the Fox Hills and Hell Creek Formations, and the Fort Union Group.

Water from the Dakota aquifer is saline and is a sodium chloride type. The dissolved solids content in the water sampled outside the reservation exceeded 4,000 milligrams per liter (mg/l). Yields ranging between 130 and 320 gallons per minute (gpm) were reported for Dakota wells located outside the reservation. The water is too saline for most uses but is used for repressuring oil fields. There are no known Dakota wells within the boundaries of the reservation.



Water from the Fox Hills and Hell Creek Formation is a soft sodium bicarbonate type. The dissolved solids content of water sampled within the reservation ranged from 1,230 to 1,990 mg/l. The potential yields of aquifers within these formations within the reservation are unknown. Yields of between 10 and 50 gpm have been measured in wells outside the reservation tapping aquifers in the Fox Hills and Hell Creek Formations.

Water from the Fort Union Group is soft-to-very-hard and is a sodium bicarbonate type. The dissolved solids content of water sampled within the reservation ranged from 453 to 3,870 mg/l. Yields of most wells tapping this unit within the reservation yield less than 10 gpm. Maximum potential yields in the thicker sand units within the reservation are estimated to be in the range of 50 gpm.

The aquifers with the greatest potential for development within the reservation are those in the Quaternary glacial deposits generally associated with buried valleys. Major identified aquifers within the reservation include the New Town Aquifer, the White Shield Aquifer, the Lower Reach of Shell Creek Aquifer System, and the East Fork Shell Creek Aquifer.

No estimate could be made of recharge to the bedrock or glacial-alluvial aquifers within the boundaries of the reservation due to the lack of data. Similarly, no estimate could be made of groundwater in storage in the Cretaceous or Tertiary bedrock aquifers within the reservation. It was estimated that between 497,000 and 503,000 acre-feet of groundwater is in storage within the major identified glacial aquifers in those portions of Mercer, McLean, and Mountrail Counties located within the reservation. No data was available on groundwater in storage within glacial aquifers for that portion of the reservation located in Dunn and McKenzie Counties at the time of this report. The figures reported above for storage are only estimates

and should be adjusted as more information is obtained on groundwater within the reservation.

It was estimated that a total of 700 acre-feet per year of groundwater is presently being used for a combination of rural domestic, municipal and livestock purposes within the boundaries of the reservation. Statistics show that 100 to 350 acre-feet per year of the total is derived from bedrock aquifers with the remaining 350 to 600 acre-feet per year presently being derived from the Quaternary Aquifers. The above figures are only rough estimates obtained through estimating population and individual daily water use and could be found to be low as more information is gained on groundwater use within the reservation.

The rural population of the reservation is dependent upon groundwater for its stock and domestic needs. In addition, the communities of New Town, Parshall, White Shield, Mandaree and part of Twin Buttes, all within the reservation, obtain their water supplies from wells. The use of groundwater for irrigation is presently of minor importance within the reservation. However, several sprinkler units are being developed in the shallow aquifers just off the southeastern corner of the reservation. Any large development of groundwater within the reservation should be preceded by an adequate geohydrologic investigation to determine the quality and quantity of available groundwater for a particular use on a site-specific basis.

The application of irrigation water within the reservation will have to be carefully managed as well as due consideration given to the geology, soils, and hydrology in proposed irrigation areas to avoid drainage, saline soils, erosion, and overdraft problems. Reference should be made to Table 4.

Table 4

SUMMARY OF GROUNDWATER DATA WITHIN UNDIMINISHED BOUNDARIES  
FORT BERTHOLD INDIAN RESERVATION

Geologic Group, Formation or Group	Estimated Groundwater in Storage (Acre-feet)	Estimated Annual Recharge (Acre-feet/year)	Reported Range of Transmissivities <sup>1/</sup> (gpd/ft <sup>2/</sup> )	Reported Range of Specific Capacities <sup>2/</sup> of Drawdown	Reported Range of Yields-Existing Wells <sup>3/</sup> (gpm)	Reported Maximum Potential Yields <sup>4/</sup> (gpm)	Dissolved Solids Concentrations (mg/l) <sup>5/</sup>	Existing Uses of Groundwater
Dakota Group	--	--	--	--	130-320	--	4,000 <sup>2/</sup>	Pressure Oil <sup>1/</sup> Fields
Fox Hills Basal-Hell Creek Aquifer	--	--	13-3,100 <sup>2/</sup>	0.1-0.6 <sup>2/</sup>	2-50	60	1,230-1,990	Domestic & Stock
Upper Hell Creek & Lower Cannon-Ball Ludlow Aquifer	--	--	1,000-5,950 <sup>2/</sup>	0.1-0.6 <sup>2/</sup>	10-50	--	1,500-1,900	Domestic & Stock
Ft. Union Group	--	--	1,000-6,000 <sup>2/</sup>	0.35-2.6	10	50	453-3,870	Domestic & Stock
White Shield Aquifer	384,000	7,500-16,700	5,300-21,000	16	175	1,000	453-3,810	Public Domestic & Stock
New Town Aquifer	101,000	--	140,000-260,000	18-50	150-485	1,000	982-1,380	Public Domestic & Stock
Lower Reach of Shell Creek Aquifer System	6,700-9,100	--	--	--	--	100	1,390-1,830	Domestic & Stock
East Fork Shell Creek Valley Aquifer	4,300-6,600	--	22,000	9	400 <sup>2/</sup>	300 <sup>2/</sup>	1,560-3,270	Public, Domestic & Stock
Vans Aquifer	700	--	12,000	--	--	150	--	Stock

SOURCE: HKM Consulting Engineers.

<sup>1/</sup>Transmissivity - Rate at which water is transmitted through a unit width of the Aquifer.<sup>2/</sup>Gallons per day per foot.<sup>3/</sup>Specific Capacity - Rate of Discharge from a well divided by the drawdown of the water in the well.

Data obtained outside undiminished boundaries of Reservation.

<sup>4/</sup>Gallons per minute.<sup>5/</sup>Milligrams per liter.

The Inventory of Water Resources goes on to define water supply, water right claims, and present use on the Ft. Berthold Reservation. Both quantity and quality aspects of the surface and groundwater resources of the reservation were reviewed in depth.

#### Surface Water

Surface water is the major source of water supply on the reservation. Three primary sources of water include the Missouri River, the Little Missouri River, and the local minor tributaries flowing through the reservation. All of these sources are united in Lake Sakakawea which inundates approximately 113,000 acres of land within the boundaries of the reservation. The streamflow which originates on and near the reservation, while small in order of magnitude when compared to the mainstem of the Missouri River, is of local significance and needs quantification. Streamflow correlation studies estimate that the Ft. Berthold Reservation experiences a mean annual runoff of approximately 52,000 acre-feet. Of this total, 38,000 acre-feet arises on the Diminished Reservation. All of this flow is tributary to the Missouri River.

Lake Sakakawea, the reservoir formed by Garrison Dam on the Missouri River, completely dominates the surface water resources of the reservation. Built with a capacity of 24,137,000 acre-feet, the reservoir has completely inundated the channels of the Missouri and Little Missouri Rivers within the reservation.

The principal surface water resource of the reservation is, necessarily, the Missouri River. Average annual flow above Garrison Dam has been estimated under a 1970 level of flow condition at 16,952,000 acre-feet per year. Effectively, this is the total estimate of surface flow which arises on, passes through, or is adjacent to the Ft. Berthold Indian Reservation. This surface water resource is immense. Of this quantity, approximately 52,000 acre-feet of runoff arises within the reservation boundaries (Table 5).

Table 5  
TOTAL SURFACE WATER RESOURCES  
(Ft. Berthold Reservation, North Dakota)

Description	Mean Annual Runoff (acre-feet per year)
Missouri River at Lake Sakakawea <sup>1/</sup>	16,952,000
Yellowstone River near Sidney <sup>2/</sup>	8,800,000
Missouri River near North Dakota border <sup>2/</sup>	7,276,000
Little Missouri River near mouth <sup>2/</sup>	390,000
Ft. Berthold Area <sup>3/</sup>	131,100
Other Tributaries <sup>4/</sup>	354,900
Total Flow Arising on or Passing Through Ft. Berthold Reservation <sup>5/</sup>	16,952,000

SOURCE: HKM Consultants, Water Work Group Report, Northern Great Plains Resource Program, December 1974.

<sup>1/</sup>Northern Great Plains estimate of 1970 level flows for entire reach of the Missouri River and its tributaries to Garrison Dam.

<sup>2/</sup>Based on 1970 level flows as defined in Northern Great Plains Study.

<sup>3/</sup>Approximately 52,000 acre-feet/year arises in an average year on the Ft. Berthold Reservation.

<sup>4/</sup>Difference between the total flow of the Missouri River above Garrison Dam and the flow entering Lake Sakakawea near the Montana-North Dakota state line, plus runoff accounted for in the Little Missouri River and Ft. Berthold area. The vast majority of this tributary flow passes through or is upstream of the Ft. Berthold Reservation.

<sup>5/</sup>Therefore, total annual flow (1970 level) arising on or passing through the reservation is set at 16,952,000 acre-feet/year.

Water availability will necessarily be affected by future upstream consumptive use of water. Current depletions above Garrison Dam approach 2,000,000 acre-feet for the 1970 level of development. The effects on the Ft. Berthold Reservation of upstream water development will be reflected in the water levels at Lake Sakakawea. Reservoir operation criteria will be a major issue in future years as water availability becomes more acute.

Existing surface water rights of record were researched in an initial step toward documenting existing water use on the reservation. In addition, present use rights were inventoried and documented. Existing water consumption takes the form of municipal and domestic, stock, and irrigation uses. Total consumptive use of surface water resources was found to be less than 2,000 acre-feet per year.

Surface water quality information was available for only three streams. These included Bear Den Creek near Mandaree, Shell Creek near Parshall, and the Missouri River at Garrison Dam. Historic data indicates that the highest quality surface water within the reservation is that contained in Lake Sakakawea. Except for being very hard, the water contained in the lake appears to be satisfactory for irrigation, livestock watering, recreation, fish and wildlife, and municipal and industrial purposes. Water in Bear Den and Shell Creeks during periods of runoff from snowmelt and rainfall are more dilute than that carried by the creeks at their lower stages. Water from both creeks is generally undesirable for domestic use due to high hardness and the high iron, manganese, sodium, and sulfate content.

#### Tabulation of Existing Water Rights

As an initial step in documenting existing water uses on the Ft. Berthold Reservation, existing water rights of record were researched. A common source of such data is the records of the North Dakota State Water Commission in Bismarck. There are also records of some uses, but not water rights as such, in the agency office of the BIA.

It is a matter of choice for a water user on the reservation to record his right in the state offices, since the Tribes do not recognize any state jurisdiction of Indian water uses. Although the state does not claim jurisdiction over Indian water uses, they have urged the reservation inhabitants to record their water uses with the state in order to document such uses. This suggest-



ed practice, however, has not been followed. Table 6 shows a list of state water permits of record on the reservation. The information was obtained from the North Dakota State Water Commission in July 1975. The permits shown are for both the Diminished Reservation and for the Homestead Area to the north and east.

The requirement by the U.S. Corps of Engineers for a Section 10 permit (1899 Rivers and Harbors Act) has provided a vehicle for Tribal water uses to be documented. This act requires a permit from the Corps for any structure being built in the floodplain of a navigable river. This floodplain definition has been extended to include the taking area of Lake Sakakawea, and a Section 10 permit has been applied for concerning a small pilot or demonstration Tribal irrigation system.

Table 6

WATER PERMITS ON FILE WITH THE STATE OF NORTH DAKOTA  
(Within Reservation Boundary Including Homestead Area)

No.	Name of Applicant	Water Use	Location			Source	AF <sup>1</sup>	AC <sup>2</sup>	Date
			S	T	R				
1815	George Gilbertson & Sons	Irrigation	7	149	89	Garrison			
			18	149	89	Reservoir	586	293	12-23-71
			13	149	89				
			24	149	90				
1171	City of Parshall	Municipal	Not Given			Groundwater	420	NA	04-22-64
1823	City of New Town	Municipal	19,20	152	92	Groundwater	480	NA	02-02-72

SOURCE: North Dakota State Water Commission 1975.

Note: NA signifies information not applicable.

<sup>1</sup>Acre-feet.

<sup>2</sup>Acre.

The Department of the Army issued to the BIA a "Permit to Other Federal Government Department or Agency to Use Property" for the Twin Buttes municipal supply pipeline. The permit grants "...the right to construct, operate and maintain a water supply pipeline over and across certain government land situated in Mercer County to furnish water to Twin Buttes, North Dakota."



In addition, the Public Health Service has applied to the Corps of Engineers for a Section 10 permit for the municipal system at Mandaree.

The Three Affiliated Tribes have established (1975) a Tribal water use permit program on the reservation, as have many other tribes. Basically, this entails that any entity using or wishing to utilize water out of Lake Sakakawea must file an application with the Affiliated Tribes. At present, this permit system excludes groundwater and surface water sources other than Lake Sakakawea. There is no Tribal water code in action on the reservation. The Secretary of the Interior has refused to approve any Indian water codes until more is known regarding state, federal and Indian rights. Meanwhile, the Tribes, by letter of approval dated July 17, 1975, have approved an Indian-owned irrigation project of some 100 acres. This project would divert water from Lake Sakakawea in W<sub>2</sub>SE<sub>4</sub> Section 2, T.146N., R.89W.

North Dakota historically has not required a surface water permit for domestic or stock water uses. This, coupled with the fact that most water uses on the reservation are not recorded with the state, suggests that there are probably many unrecorded water uses on the reservation.

#### IMPACTS

Indian claims to the water in Lake Sakakawea have not been adjudicated or settled by agreement and cannot be evaluated at this time. The water supplies that are being used on the reservation would not be affected by any of the proposed Level 1 mines. The projected increased population that would move into the Knife River Valley could expand groundwater use for municipal or domestic supplies, and some wells could be drilled to the Fox Hills-basal Hell Creek or the Hell Creek-Cannonball-Ludlow aquifers. These aquifers extend beneath the reservation, but their present usage on the reservation is minimal. To postulate significant reduction of the water

supply from the deep aquifers by extensive use outside the reservation would not be realistic.

Impacts of full Level 2 development on the water resources of Ft. Berthold would be largely unchanged from those discussed in Level 1. The Renner's Cover mine area is adjacent to the extreme southeast corner of the reservation and mining along the boundary could affect the water supply in the aquifers within the reservation south of Lake Sakakawea. However, the effects would be unnoticeable one mile or less from the mine.

If Indians from Ft. Berthold were employed at the mines in Mercer County, they might choose to move into the southeast part of the reservation and establish a community there. Water supply and sewage-disposal systems would be required, and each would have its impact on the water resources of the area.

Similarly, the Nokota Mine could employ Indians from Ft. Berthold, but these would likely choose to live north of Lake Sakakawea, in McLean or Mountrail Counties.

Mining in Level 3 areas beyond that indicated for Levels 1 and 2 would have relatively little effect on the water resources of the reservation. Extensive mining in the Garrison area could include mining adjacent to the reservation in McLean County. Disturbance of shallow aquifers would lower the water table for a distance of no more than a mile within the reservation. The melt-water aquifers in the Garrison Level 3 area would not be mined, but quality of the water in them could be degraded by movement of water into them from adjacent mined land. The degradation would be from higher sodium and sulfate or bicarbonate concentration in the incoming water.

Mining in the Dickinson-Dunn and Hazen Level 3 areas could have the same potential impacts on that part of the reservation south of Lake Sakakawea as mining in the Garrison area could have on the McLean County portion.

## MITIGATION

According to the North Dakota Century Code where water supplies, primarily wells or springs, are destroyed by mining or have their water tables lowered because of adjacent mining, the applicants are committed to replacing the lost water supplies. If these impacts should occur to the reservation, however, it would be questionable whether or not the mining company would be legally bound to this stipulation since it is a state law and the state has no jurisdiction on the reservation.

## RESIDUAL ADVERSE IMPACTS

If degradation of aquifer water quality or the lowering of water tables should occur on the reservation creating either a loss of water quality or quantity as a result of the proposed action off the reservation and no state or federal mitigation is applied, this could be viewed as a residual adverse impact to the reservation.

Lake Sakakawea would contribute about 40,050 acre-feet per year for the gasification and power plants throughout their operational lives. The lake level would be lowered about two inches per year. This would be the amount of water lost to the Three Affiliated Tribes for industrial, agricultural, or energy related uses.

## SHORT TERM USE VS. LONG TERM PRODUCTIVITY

Short term use of the water resources of the study area would terminate gradually with the closures of the individual mines and plants. Long term effects on the water resources of Ft. Berthold might include dewatering of aquifers and chemical degradation of water by partial solution of mine and plant wastes. These changes would essentially be permanent.

## IRRETRIEVABLE RESOURCE COMMITMENTS

Water used by energy plants from Lake Sakakawea would be unavailable for use for other purposes during the lives of the projects.

Destruction or degradation of underground reservation water supplies would be viewed as an irretrievable resource commitment as a result of the proposed action.

## ALTERNATIVES

The no action alternative would limit development beyond those plants and mines already in existence or under construction. This alternative would almost totally eliminate impacts to water resources of the Ft. Berthold Reservation. Approximately 40,050 acre-feet of water would not be drawn off Lake Sakakawea since the two gasification plants and three electrical generating plants could not be constructed. Groundwater degradation on Ft. Berthold also would not occur since those mines closest to the reservation would not be constructed.

The no leasing of federal coal alternative would prevent the construction of the NGPL project located approximately 15 miles from the southern portion of the reservation. This would mean that no water would be drawn from Lake Sakakawea for this project.

Aquifer destruction may still occur on the reservation since, if no federal coal were leased, a wider area of private coal would be leased, causing a wider area of shallow aquifer destruction.

The alteration of plant construction and timing alternatives would have no direct significant influence on the impacts of water resources.

Project modification (alternative #4) could reduce the impacts on water resources, especially with regard to chemical pollutants in waste water through changing waste disposal systems.

## ANIMALS

### BASELINE INFORMATION

Wildlife on the Ft. Berthold Reservation has been severely reduced from historic levels, but perhaps not as much as in the surrounding seven county area since portions of the reservation bordering what was once the Missouri River bottom (before the Garrison Dam) remain essentially the same as in historic times with the exception of human encroachment and grazing by domestic livestock.

Those species most notably reduced or eradicated entirely from the reservation since historic times are the elk, golden eagle, black bear, buffalo, and mink. The Garrison Dam Reservoir which flooded one-fifth of the reservation severely reduced the numbers of woodland species. Each year more native grassland is being destroyed for agricultural purposes, a trend which is expected to continue. This loss of native grassland serves to reduce the population of game species dependent upon the grassland type of habitat, particularly the sharptail grouse and various rodent species. Extensive overgrazing by domestic livestock also contributes to a loss of habitat and subsequent reduction in wildlife populations.

Future trends indicate wildlife populations on the reservation will decline slightly in most areas of the reservation as a result of continued contact with humans and a loss of habitat quantity and quality.

The Three Affiliated Tribes maintain a department of Fish, Game, and Recreation. The department is responsible for conservation of wildlife and enforcement of tribal hunting regulations. The department has also begun to collect data on wildlife populations on the reservation, but has not completed compilation of this data to-date.

## IMPACTS

Wildlife and domestic animal populations on Ft. Berthold should not be significantly impacted by the Level 1 proposed actions. Although air pollution (discussed in the Air Quality section) and increased numbers of non-Indian visitors to the reservation could reduce animal populations, it is likely that the impacts would not be measurable.

It is not likely that wildlife and domestic animal populations would be significantly impacted under Level 2. Although impacts from air pollution (discussed in the Air Quality section) and increased numbers of non-Indian visitors would be greater than under Level 1, it is likely that those impacts would not be significant.

Since the Level 3 areas do not include Ft. Berthold, the suitability analysis does not pertain to this section. Impacts from mining within the Level 3 areas could impact wildlife on the reservation, primarily via disturbances related to increased non-Indian visitor use. It is likely, however, that these impacts would not be measurable.

## MITIGATION

Since most impacts to the wildlife of Ft. Berthold are of a secondary nature such as reduction in wildlife populations due to loss of habitat and disturbance caused by recreators, whose increased numbers are a result of coal development, mitigating measures on federal and state levels would not be applicable.

The Three Affiliated Tribes may implement mitigating measures on the reservation to reduce these impacts. The primary measure would be to increase enforcement activities and adequately patrol the reservation. This would most likely be a responsibility of the Three Affiliated Tribes Department of Fish, Game, and Recreation.



### RESIDUAL ADVERSE IMPACTS

Impaction of wildlife on Ft. Berthold would only occur with peak population increases during the life of the projects. Thus, no adverse impacts could be termed residual unless wildlife populations never returned to their original numbers, which is a possibility.

### SHORT TERM USE VS LONG TERM PRODUCTIVITY

Long term productivity of wildlife population could be impaired by significant short term reduction of wildlife populations.

### IRRETRIEVABLE RESOURCE COMMITMENTS

The numbers of reservation wildlife lost due to illegal hunting or disturbance and loss of habitat could be viewed as irretrievable resource commitments.

### ALTERNATIVES

The only alternative which would significantly reduce wildlife populations on the Ft. Berthold Reservation would be the no action alternative which would limit off-reservation development to only those mines and conversion plants now in existence or under construction. The other three alternatives, no leasing of federal coal, alteration of plant construction schedules, and project modification might reduce population impacts but not significantly.



## PRE-HISTORIC AND HISTORIC FEATURES

### BASELINE INFORMATION

The Three Affiliated Tribes - Mandan, Hidatsa, and Arikara - have an history in the seven county study area extending back into prehistoric times. The ancestors of these three tribes lived along the Missouri River valley and lesser river valleys in earthlodge villages. They also utilized the resources of the surrounding plains to supplement their farm resources from the valley. Although some earthlodge villages could be tied to one or more of the Three Affiliated Tribes, those sites on the surrounding plains contain artifacts too generalized to allow association with any of the Three Tribes.

Historically, the U.S. government designated reservation for the Three Affiliated Tribes included all of the seven county study area south to the Heart River. Historic records have not been sufficient to associate any particular feature outside of the present reservation to the Three Tribes. However, burials may be discovered in the seven county study area which could be associated with Mandan, Hidatsa, or Arikara.

### IMPACTS

One prehistoric earthlodge village (MDU/Coyote pipeline right-of-way) would be impacted. This site may be related to the ancestral Mandan, Hidatsa, or Arikara. No other impacts are known for Level 1 areas. However, because inventories are not complete for these areas, it would be possible that Indian burials could be discovered and impacted.

No inventories have been conducted on Level 2 areas. However, one Level 2 area (Washburn Mine) fronts on the Missouri River. Earthlodge villages, related to the Three Affiliated Tribes could be located in this area and impacted by mining. The possibility of Indian burials exists throughout the Level 2 areas. These would be of critical interest to the Three Affiliated Tribes.

Prehistoric features which could be identified with the Three Affiliated Tribes and impacted by mining in Level 3 areas would be the later earthlodge village sites, which were centers of ancestral Hidatsa, Mandan, and Arikara culture. Impacts of importance to Ft. Berthold could occur in the river valley portions of Garrison, Dickinson-Dunn, Hazen-North Beulah, Beulah-Center, and Underwood Level 3 areas.

Historically, the entire seven county study area was a part of the Indian reservation for the Three Affiliated Tribes, until the reservation was reduced to approximately its present boundaries by Executive Orders in the Nineteenth Century. Because no written records have been located which deal with Indian use of this area, and the Late Prehistoric sites contain artifacts which are too generalized to identify with any single Indian group, only one area of potential impacts can be tentatively identified. Any burials of Indians (which could probably be identified with a particular Indian group) encountered in Level 3 areas would be extremely sensitive to the Three Affiliated Tribes.

#### MITIGATION

The applicant is committed to complying with federal and state legislation concerning antiquities, namely the Antiquities Act of 1906 which protects antiquities including historic and prehistoric features on federal land and under coal mining regulations, applies to federal minerals under private surface.

Other federal acts which protect historic features are the National Environmental Policy Act of 1969 and the Archeological and Historic Preservation Act of 1974. State of North Dakota mining regulations and facility siting acts in effect require protection of prehistoric and historic features. Portions of the North Dakota Century Code also protect antiquities under state jurisdiction.

Since historic and prehistoric features found in mining and other proposed action off the reservation are protected by state and federal laws, the respective state and federal agencies will be handling the excavation of any sites found. Thus, Indian artifacts found may (most probably) be kept by the State Historical Society. It has been suggested by the Three Affiliated Tribes Museum, Inc. that any artifacts which can be identified as that of the Mandan, Hidatsa, or Arikara be given to the museum for display. Because of the present jurisdictional situation, however, this would have to be litigated between the State Historical Society and the Three Affiliated Tribes.

The MDU/Coyote 1 Level 1 proposal contains an earthlodge village site. If an analysis of the artifacts from this site prove to be related to one of the Three Affiliated Tribes, some provisions could be made to place either the artifacts or the cultural information with the Three Affiliated Tribes Museum, Inc. in New Town, North Dakota.

#### RESIDUAL ADVERSE IMPACTS

Destruction of historical sites and artifacts specifically related to any one of the Three Affiliated Tribes without adequate preservation of information could be viewed as a residual adverse impact.

### SHORT TERM USE VS. LONG TERM PRODUCTIVITY

Short term use of the environment for the purpose of coal mining and ancillary construction would destroy all long term productivity in terms of cultural resources. Sites destroyed either by mining or controlled scientific excavation could not be studied by improved future archaeological methods.

### IRRETRIEVABLE RESOURCE COMMITMENTS

Both prehistoric and historic sites are a nonrenewable resource. That which is disturbed by the proposed action is destroyed. In all cases where archeological sites are impacted there will be significant irreparable information lost. Commitment of any Indian historical resources would be final and irretrievable. Thus, this information about the culture of past generations would be lost to future generations of Indians.

### ALTERNATIVES

The no further action alternative would probably have the most significant effect on the preservation of historic and prehistoric features. If only existing energy projects were allowed to operate, the 136 known prehistoric and historic sites would not be disturbed. No further leasing of federal coal would eliminate impacts on 131 of the 136 known prehistoric and historic sites by stopping development of NGPL and possibly Consol Glenharold. The other two alternatives, alteration of plant schedule and project modification, would not significantly reduce impacts to prehistoric and historic features.

## AESTHETICS

### BASELINE INFORMATION

Aesthetics on the Ft. Berthold Reservation in general are very pleasing. Portions of the reservation remain relatively pristine. Background and sound levels are generally low. In the western segment of the reservation some distant motor noise can be heard from oil exploration rigs. However, such noise occurs infrequently.

Background sound levels on the Ft. Berthold Reservation range from quiet to very quiet and are essentially the same as those found in rural environments throughout the seven county study area.

Odors can also be attributed to oil wells and to the burning of natural gas. Other factors which contribute to a slight loss of aesthetic quality on the reservation are agriculturally related activities which produce noise and destroy native areas, and traffic in the form of cars, trucks, all terrain vehicles, snowmobiles, and airplanes.

Concentrated enclosures of livestock such as feedlots sometimes cause strong odors, but such sources are infrequent occurrences on the reservation.

Some odor can be attributed to agricultural chemicals used seasonally on the fields. Odors associated with the rural environment are similar to those found throughout the seven county study area.

Only 350-400 people live in the south segment of the reservation which is close to the NGPL, ANG and Basin areas. The area immediately across from the proposed intake structures of these plants has a population of about 10 to 15 residents. Although these figures may not be large, other members of the tribe might pass through the area on foot, horseback, or vehicle.

## IMPACTS

The tops of the boiler and emission stacks of NGPL, ANG, and Basin, particularly the taller ones, may be visible from parts of the Ft. Berthold Reservation. However, because of the distance between the project sites and the reservation, which is a minimum of 11 miles for NGPL and 8 miles for ANG and Basin, the visual impact would be insignificant. The strobe lights on the stack would call attention to the areas, particularly at night. These lights would not draw attention to the stack's shape since the darkness of night usually would not reflect its form. Approximately 20-30 residents might be potentially affected, based on an approximately population density of the area.

The water intake structures for these plants might be visible from parts of the reservation on the north shoreline and the bluffs above the shore immediately across from the intake. The 10-15 residents who live nearby could be affected.

The presence of the project would be evident to any Indian or other traveler of the major roadways, such as State Highway 200 near NGPL or some of the backroads near ANG or Basin.

No Level 1 projects are within the Ft. Berthold Reservation; however, the water pumping station and pipeline on Lake Sakakawea for the ANG Coal Gasification Plant are within 1.5 miles of the reservation boundary. Increased sound levels associated with construction of these facilities would not have a perceptible effect on residents of the reservation.

There should be no odors produced by any of the Level 1 projects which would be perceived by any of the residents of the Ft. Berthold Reservation.

Coyote 2, because of distance and screening by topography, should not be visible from the reservation.



Renner's Cove Mine, which lies adjacent to the eastern boundary of the southern segment of Ft. Berthold Reservation, may be seen locally by adjacent parts of the reservation. Such visual intrusions as the draglines and spoil piles visible on the skyline and dust from the mining operations may be noticed from limited portions of the reservation. This portion of the reservation is sparsely populated and no significant effects due to sound level increases or odoriferous substances on the reservation are expected to occur.

#### MITIGATION

All projects must comply with federal noise exposure levels established in response to the Occupational Safety and Health Act of 1974 and the Noise Control Act of 1972. These acts are enforced by two federal agencies which set standards for sound levels. Measures that would reduce sound levels would include engineering devices such as mufflers or acoustical barriers and hearing protection for individuals.

Commitments to meet applicable federal and state air quality standards would pertain to mitigation of odors. The applicants would be committed to incinerating escaping gases from major points of NGPL, ANG, Basin, and Coyote. This process should eliminate most, if not all, odors.

Reducing emission stack and transmission tower height, along with painting emission stacks colors that blend in with the landscape, could help to reduce visual impacts to Ft. Berthold residents. It should be noted, however, that reducing stack height alone may tend to concentrate emissions rather than disperse them.



### RESIDUAL ADVERSE IMPACTS

The presence of the NGPL intake structure near the reservation along the southern shore of Lake Sakakawea could not be mitigated.

Even if all suggested mitigating measures are applied, minor increases in noise levels may still be noticed by some reservation residents.

The emission stacks will still be prominent features in the prairie landscape despite mitigation.

### SHORT TERM USE VS. LONG TERM PRODUCTIVITY

Short term effects on visual resources would not permanently change the landscape provided that dismantling and removal of structures and reclamation is accomplished.

Construction and operation noise would cease upon project termination; thus, no changes in long term sound levels would occur. There should be no long term odor problem.

### IRRETRIEVABLE RESOURCE COMMITMENT

Although plant site structures and emission towers are short term in nature they will represent a visual commitment for the next 25-30 years to those residents of the reservation who live close enough to see them.

### ALTERNATIVES

The no further action alternative would mean no further visual, sound, or odor impacts as a result of energy development in the area. The visual resources would probably remain similar to existing conditions. The same would be true of noise and odor levels.

The no leasing of federal coal alternative would mean that NGPL and further Consol development would not occur. Consol is too far away from the reservation to cause any aesthetic impacts. However, if the NGPL project were not built it might mean considerably less aesthetic impacts to the residents of the Ft. Berthold Reservation. The NGPL water intake structure near the southwestern edge of the reservation would not be built.

Alteration of plant construction and operation schedules, alternative #4, would not significantly change impacts nor would it decrease or mitigate significantly visual or odor impacts to residents of the Ft. Berthold Reservation.

Changes in location of mines and plants, particularly the NGPL and ANG complexes, to locations farther away would alleviate some noise and visual impacts to reservation residents. Other project modifications such as structural changes would not significantly change visual or noise impacts to reservation residents.

## RECREATION

### BASELINE INFORMATION

#### Leisure Values

There is a wide variety of recreational activities to pursue on the reservation. These are mainly outdoor in nature.

In terms of the reservation's unrealized resource potentials, recreation and tourism ranked second only to the potential for lignite mining and energy development. The reservation is divided by a body of fresh water (Lake Sakakawea) extending nearly 200 miles in length and as much as 18 miles in width at some locations. Complementing this water resource are some of the most scenic badlands in the northern plains. For those who appreciate the aesthetic qualities of rugged isolation, the area has rare combinations of attractions. In this unique setting one can pursue a wide variety of outdoor activities including boating, swimming, water-skiing, sailing, diving, fishing, ice-fishing, camping, ice-skating, snowmobiling, hunting, and cross-country skiing (see Figures 2-6).

#### Outdoor Recreation Areas

There are within the boundaries of the reservation access to at least 16 designated public use areas, and 4 areas with minimally developed facilities. The majority of these areas lie within the boundaries of the "taking area" (lands around the perimeter of the lake owned by the Corps of Engineers). However, access roads to these areas often cross private Indian lands and tribal lands. In many cases, easements for these access roads were never obtained. Therefore, access to some of the public recreational areas may be blocked or a fee charged to permit entrance.



Figure 2

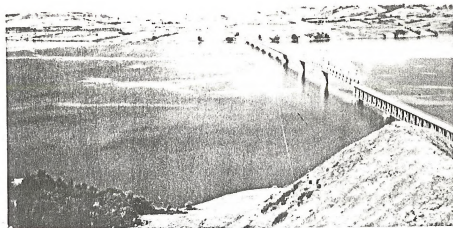


Figure 3

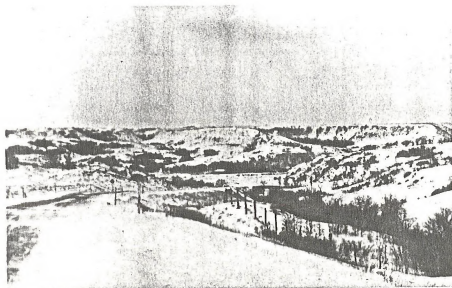


Figure 4

Many tourists and recreators enter the reservation each year to enjoy the unique and scenic attractions it has to offer.

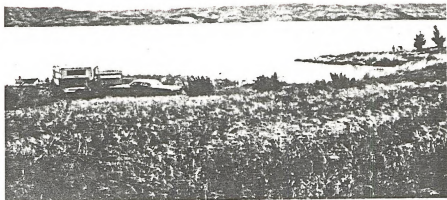


Figure 5

Camping, fishing, boating, and waterskiing are popular sports among recreators on Lake Sakakawea within the boundaries of the Ft. Berthold Reservation.

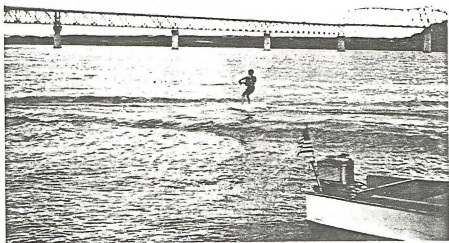


Figure 6

The Tribal Council on the reservation developed the 136 acre Four Bears Motel and Recreational Complex (see Figures 7-9 ). The recreation complex, made possible through funding by the Economic Development Administration, includes 40 motel units, a restaurant and coffee shop, convention facilities, service station, 24 unit trailer park, laundromat, marina, picnic area, Three Tribes Museum, and indoor roping arena.

The majority of outdoor recreational activities on the Ft. Berthold Reservation are limited to late spring, summer, and early fall months.

Major recreational attractions unique to the reservation include pow-wows, Indian rodeos, and Indian dancing events (see Figures 10 and 11). Several communities on the reservation host annual pow-wows and rodeos which draw contestants from throughout the United States and Canada.

#### Indoor Recreation Facilities

Indoor recreational facilities found on the reservation are very limited. Each community has a social hall where social events are held. These halls are sometimes used for roller skating and dances. Indoor roping and rodeo events are very popular indoor sports among the Indians. Usually, these are held during the winter months. There are 2 private indoor arenas and one tribally owned arena located on the reservation.

#### Natural Values

There are several tree planting and nature preserves created by the State Game and Fish Department within the taking area on the reservation. The Three Affiliated Tribes are in the process of applying to the Corps of Engineers for seven major areas along the shores of Lake Sakakawea to be used as conservation and wildlife habitat areas.



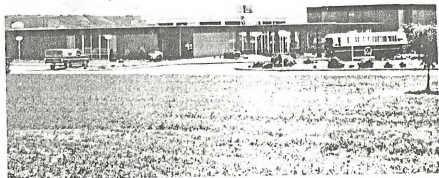


Figure 7



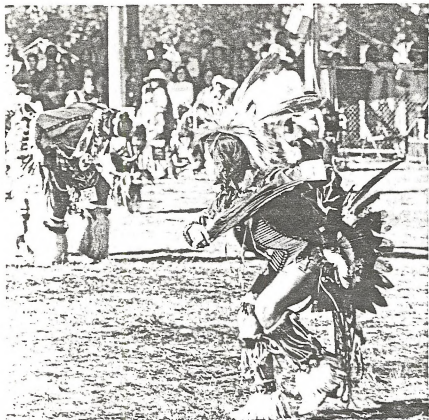
Figure 8



Figure 9

The Four Bears Motor Lodge, Museum, and camper pad, just three of the popular attractions at the multi-million dollar 4-Bears recreational complex owned and operated by the Three Affiliated Tribes.

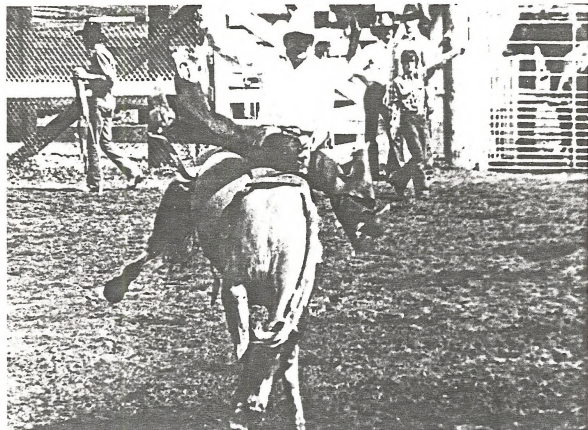




Figures 10 & 11

Ft. Berthold powwows, rodeos, and Indian ceremonial events draw visitors from across the United States and Canada.

(Photos courtesy of the United Tribes Educational and Technical Center)



The Three Affiliated Tribes have a Department of Fish, Game and Recreation which is responsible for the enforcement of tribal fishing and hunting codes and the conservation of wildlife on Ft. Berthold.

Indian attitudes toward recreational development vary. The more opportunistic support further development of a tourism and recreation industry on the reservation. The traditionalists do not favor recreation and tourism development because the land and animals are sacred to them and they do not wish to see the lands that have belonged to their people for generations exploited by outsiders.

Economists have noted great potential for recreation and tourism development on the reservation. No doubt further development of these industries would be a stimulus to the tribal economy.

#### IMPACTS

The largest Level 1 population increases would occur in Mercer and Dunn Counties, the two counties closest to the Ft. Berthold Reservation. The result would be a substantial increase in the numbers of tourists and recreationists on the reservation, especially in the southern and western segments.

Since the reservation offers a quality recreational environment, it could be expected that people associated with coal development would be entering the reservation to recreate, especially along the Sakakawea lakeshore. This would pose several problems to Indian communities. There would be noticeable increased disruption of the isolated environment that community members now enjoy. An increase in the non-Indian users on the reservation would likely mean an increase in vandalism, cutting of fences, disturbing of livestock, trespassing, and other misdemeanors. Illegal hunting of deer and upland game

could also be expected to occur with greater frequency. If these acts were committed by non-Indians, special jurisdictional problems would arise in which the offenders probably could not be prosecuted by tribal authorities under current tribal law.

Several Lake Sakakawea recreational sites on federal land are only accessible by roads for which no public easements have been obtained. Some cross individually owned or tribal lands. It is questionable whether or not these areas would be legally open to public use. In some cases, landowners may block these roads or charge a fee to permit access.

Many natural areas along the lakeshore and surrounding countryside have sacred cultural value to Indians. Some have religious importance, some are burial grounds, prayer sites, or are associated with Indian legends. Some are known only to members of certain families or clans. These areas could be unknowingly desecrated by tourists. Collectors of Indian artifacts might also disturb known burial sites in search of relics. Indian people would be affronted by such action.

The Three Affiliated Tribes (Mandan, Hidatsa, and Arikara) law enforcement staff and the Department of Fish, Game and Recreation would find it virtually impossible to patrol the reservation effectively.

An increased amount of recreation and tourism trade for the Four Bears Recreational Complex, which was specifically designed by the Three Affiliated Tribes for this purpose, could be one beneficial impact to the Ft. Berthold Reservation.

Indoor rodeo facilities may receive greater use. Local Indian pow-wows, rodeos, and ceremonies would be expected to receive greater non-Indian and tourist attendance, as would use of outdoor recreation facilities.

Recreation areas along Lake Sakakawea that have access may become very popular for camping and fishing. Some Indians who are now lakefront owners may develop facilities for selling bait, tackle, gas, and groceries. Dude ranches and trail rides may become profitable enterprises. Population increases due to energy development may also cause an increase in motorboating, snowmobiling, and the use of all-terrain vehicles on the reservation. With increased usage, there would be a need for small service stations, boat docks, grocery stores, and increased camper facilities, particularly in the south segment of the reservation. These could be developed by Indians as private or tribal enterprises. However, until issues of jurisdiction and access are resolved it is unlikely that such facilities would be built on the reservation.

No Level 2 projects would be located on the reservation. Most Level 2 impacts to recreation and tourism would be due to Level 1 projects. A small increase in recreation on the reservation would occur due to new people associated with Level 2. Increased use may disrupt the isolated atmosphere of the reservation and may cause an increase in vandalism, cutting of fences, disturbance of livestock, trespassing, and other misdemeanors. As discussed in Level 1, access and jurisdictional problems would intensify with Level 2 development. Cultural sites may be unknowingly disturbed by tourists. The small reservation law enforcement staff may not be able to adequately protect reservation resources. Beneficial effects would include increased tourist trade on the reservation as discussed in Level 1.

No Level 3 areas have been identified within the boundaries of the Ft. Berthold Reservation. Any increase in population resulting from Level 3 activity would cause increased recreational and tourist use of reservation resources. Resulting impacts would be similar to those discussed for Levels 1 and 2.

## MITIGATION

Mitigation measures could be implemented by the Three Affiliated Tribes to mitigate to some extent impacts to the recreational environment of the Ft. Berthold Reservation from all levels of proposed action.

The Tribal Council of the Three Affiliated Tribes could protect fragile cultural resources such as religious sites or undisturbed natural areas by zoning those areas "reservation restricted" (meaning non-Indians are excluded from these areas).

The law enforcement staff of the Twin Buttes community and the Tribal Fish, Game and Recreation Department could be expanded by two to four more personnel to adequately patrol lakeshore or "reservation restricted" areas to prevent vandalism, trespassing, and disturbance of cultural areas by recreationists. The Council could also consider establishing fees to allow non-Indians to cross Indian lands to get to Charging Eagle Bay and Red Butte Bay Recreational Areas at Lake Sakakawea.

## RESIDUAL ADVERSE IMPACTS

Increased numbers of tourist-recreators on the Ft. Berthold Reservation would cause increased vandalism, unauthorized trespass, and a change in the isolated nature of the reservation environment. Law enforcement problems could result due to jurisdictional questions.

Even with mitigating measures it is expected that the reservation will experience a substantial increase in visitation for the purpose of tourism and recreation. Although this would be beneficial to the recreational industry of the Three Affiliated Tribes, adverse impacts would also occur.



### SHORT TERM USE VS LONG TERM PRODUCTIVITY

In the short term there will be a loss of the isolated nature of the reservation environment due to increased use by recreators and tourists. Increased disruption of natural areas and a loss of privacy would occur in the short term. There will also be increased consumption and/or use of natural features on the Ft. Berthold Reservation such as use of camping areas or collection of driftwood, this would probably be regained in the long term.

### IRRETRIEVABLE RESOURCE COMMITMENTS

Disturbance of and/or removal of any Indian cultural areas or artifacts by recreationists would constitute an irretrievable loss of resources on the Ft. Berthold Reservation. Destruction of natural areas or consumption of natural features would be irretrievable resources commitments. Increased non-Indian recreational use of the reservation could result in an irretrievable loss of solitude and isolation which tribal members now enjoy.

### ALTERNATIVES

Under the no further energy development alternative, recreation resources and leisure values would not change significantly from baseline conditions.

If no federal coal were leased, NGPL would not be constructed. This means the numbers of visitors to the reservation would be substantially lower. Fewer problems of access, trespass damage to cultural sites, and game law enforcement would be evident. The isolated pristine nature of the reservation environment would probably remain much as it is.

If construction and startup dates were altered, impacts to the reservation would be reduced but not eliminated.

Demands for recreation and overuse of public facilities on the reservation, and the recreational use of private land on the reservation would be significantly reduced.

If ANG and NGPL projects were relocated (alternative #4) recreational impact to the Ft. Berthold Reservation could be reduced. Although relocation of the plant site ten or less miles further away from the reservation would probably not change the use of the reservation's recreation environment by the increased population. Recreation use may be decreased significantly should the plant site be moved 15 or more miles away.



## ECONOMIC CONDITIONS

### BASELINE INFORMATION

#### Population

The total population (Indian and non-Indian) on the Ft. Berthold Reservation in 1970 was 7,800. Of the total 2,700 (35%) were Indian and 5,100 (65%) were non-Indians (1970 US Census). In 1975 the total enrollment of the Three Affiliated Tribes (Mandan, Arikara, and Hidatsa) was 5,800. The Indian population living within the boundaries of the reservation was 2,935 with 180 Indians maintaining residences near the reservation (Bureau of Indian Affairs 1977).

The population of the reservation is divided into five isolated segments by the waters of Lake Sakakawea. The Indian population density was approximately five persons per square mile as of 1976. There are two municipalities located on the reservation, New Town and Parshall. The populations were 1,428 and 1,246 respectively (New Town Indians 42, Parshall Indians 167) (1970 US Census).

The majority of the Indian population is of Mandan, Hidatsa, and Arikara descent with much intermarriage occurring between these tribes.

The non-Indian population on the reservation has declined about one percent per year between 1970 and 1976 (Merchant 1977). It is expected to continue to decline at the present rate without energy development. This out-migration is caused by a lack of sufficient economic activity to maintain all segments of the population. The Indian population on the reservation, on the other hand, has shown an annual average increase of 2.1% from the period 1970 to 1976 (Lindley 1977). Regardless of development (off-reservation) the Indian population would be expected to increase at the present rate based largely on a decline in

out-migration rates due to continued progressive Indian oriented economic development on the reservation, and also on the assumption that the largest Indian age group, which is now under 16, will reach child-bearing age in the next two decades (Table 7).

Bureau of Indian Affairs records (Ft. Berthold Agency) indicate an estimated 556 Indian family units on the reservation with an average of five persons per family unit. The distribution of these households is largely rural.

### Employment

In May of 1977 the total Indian labor force on the Ft. Berthold Reservation was 1,088. Of this force 705 (65%) were employed while 383 (35%) were unemployed. Only 34.9% of the Indian population was employed (Bureau of Indian Affairs Ft. Berthold Agency 1977). An average of 38% of the potential Indian labor force remained unemployed from 1971-76 (Lindley 1977). This is not unusual when one considers the fact that North Dakota has the highest Indian unemployment by a wide margin of any of the states with a large Indian population (Harris 1975). This situation is a result of a lack of training in specific job skills, limited exposure to off-reservation environment and socio-psychological attachment to culture and ethnic group (Lindley 1977).

Another major factor is lack of job availability on Ft. Berthold due to a developing economy which, though improving, still does not provide enough job opportunities. With implementation of federal and tribal programs initiated primarily to lower the high unemployment rate, unemployment has dropped 2.8% annually in the period from 1971-1976 or 14% overall (Lindley 1977).

Indians have various opportunities for employment assistance and training available to them. The North Dakota Job Services maintains an office in New Town. Indians can receive technical training and job placement through the United Tribes Educational Technical Center in Bismarck. The Bureau of Indian

Affairs offers employment assistance. The Division of Indian and Native American Programs (DINAP), together with the Three Affiliated Tribes, operates an employment assistance program. The DINAP Program seeks to provide opportunity to acquire training and develop skills in the area of job training and work experience for youths, high school dropouts, and adults. This agency also attempts to provide public service employment in the areas of social services, health, education, and administration.

The employment situation on Ft. Berthold is not expected to be altered in the immediate future. Current federal works programs are helpful in alleviating some short-term unemployment. Significant long-term reduction of the reservation unemployment rate will only occur with a more viable economy and establishment of an Indian business sector. Economic planning for the Three Affiliated Tribes is being done by tribal planners to increase employment opportunities.

#### Income

On the basis of per capita income, Indians are the most impoverished group in the nation. In fact, income for Indians in North Dakota is among the lowest recorded for states with large Indian populations (Table 8). The median income in 1969 for North Dakota Indian families was \$4,437 which was substantially lower than the state and national median family incomes of \$7,836 or \$8,808 respectively (Harris 1975).

Income for Indians on the Ft. Berthold Reservation is derived from five major sources: agriculture, minerals, federal employment, tribal employment, and public assistance or welfare.

Farm income to Indians on Ft. Berthold is derived mainly through the leasing of agricultural lands (Table 9). Approximately 30% of agricultural acres on the reservation are used by non-Indians. The estimated total farm income from

Table 7

## FT. BERTHOLD INDIAN POPULATION BY AGE GROUPS

	Total	Under 16	16-24	25-34	35-44	45-64	65+
Male	1,634	575	440	220	146	168	85
Female	1,592	543	431	215	144	170	89
Total	3,226	1,118	871	435	290	338	174

SOURCE: Aberdeen Area Statistical Report BIA 1977.

Table 8

TYPE OF INCOME OF FAMILIES IN 1969:  
NORTH DAKOTA INDIANS, NORTH DAKOTA, AND UNITED STATES

	North Dakota <sup>1/</sup> Indians (%)	North Dakota <sup>2/</sup> (%)	U.S. <sup>3/</sup> (%)
All families with wage and salary income	78.0	76.7	86.3
with non farm self-employment income	2.8	12.9	10.8
with farm self- employment income	10.4	32.1	4.6
with Social Security income	14.7	21.3	19.7
with public assistance or public welfare income	45.4	3.8	5.3
with other income	25.8	37.8	35.1

SOURCE: North Dakota Indian Reservation Economy, A Descriptive Study.

<sup>1/</sup>Calculated from: U.S. Census of the Population, Vol. II, Subject Report, American Indians, p. 116.<sup>2/</sup>Calculated from: U.S. Census of the Population, Vol. I, Detailed Characteristics: North Dakota, p. 483.<sup>3/</sup>Calculated from: U.S. Census of the Population, Vol. II, Subject Report, Sources and Structure of Family Income, p. 314.

Table 9  
FARM INCOME DERIVED FROM RESERVATION LANDS  
(Fiscal year 1974-75)

Crop	Income
Small grains	\$4,443,640
Forage, Hay & Tame Pasture	45,750
Garden Crops	30,600
Grazing	<u>1,371,500</u>
Total	\$5,891,490

SOURCE: Ft. Berthold Agency statistical data, Bureau of Indian Affairs.

reservation lands is \$4,779,441 and of this total \$2,858,250 was produced by non-Indians.

Oil and gas production is an important part of the reservation economy. Ft. Berthold is one of six reservations nationally which together account for 50 percent of the total mineral income from reservation lands annually (Harris 1975).

Approximately 2.4 million dollars was spent on the reservation through tribally administered federal and private grant programs. This was exclusive of monies received specifically for operation of Farmers Home Administration, Bureau of Indian Affairs, and the Public Health Service (Table 10).

There is only one company currently engaged in manufacturing on the reservation, that being the Northrup Corporation which is manufacturing an aviation component. There are 26 Indian employees at the plant who average a gross income of \$145.00 per week.

F&J Construction, a construction firm from Dickinson, has been the main firm receiving bids for construction projects on the reservation for several years. They use Indian labor when it is available.

Table 10

## CLASSIFICATION OF RESERVATION PROGRAMS AND FISCAL YEAR 75-76 FUNDING

PROGRAM	FUNDING AMOUNT
Community Action Program	\$272,900
Ft. Berthold Aging Services	25,000
Community Action Program EDA Title X	460,300
Alcoholism Rehabilitation Program	48,400
Community Health Representative Program	96,895
Lay Advocate Program	27,830
General Administration Fund Tribal Finance	27,876
Revenue Sharing	63,650
Tribal Business Council	130,000
Title IV - Education Program	45,000
Supplemental Security Income (SSI) Model Project	2,100
Indian Action Team	220,000
Tribal Work Experience Program (TWEP)	86,000
Community Food Program	21,750
Home Improvement Program (HIP)	53,000
Indian Youth Clean-up	10,000
Judicial	37,239
Tribal Management	50,000
Adult Education	21,500
Demonstration Irrigation	15,000
Stock Water Reservoir Project	50,000
Total	\$1,764,444

SOURCE: Tribal Finance, Three Affiliated Tribes.



## Taxes

The Ft. Berthold Reservation does not fall under state jurisdiction; therefore, Indians are not subject to state taxes. State sales taxes are not collected from Indians on the reservation. Indians pay the state motor vehicle tax on gasoline, tires, etc., which is in turn allocated to the respective counties who are obligated to provide road maintenance services. Indians also pay the state cigarette and liquor tax. The Tribal Council has recognized these taxes as responsibilities and it is expected, however, that the money collected will be distributed to the benefit of the tribes in the future. Indians do not pay the State Income Tax on wages earned on the reservation. However, they do pay Federal Income Tax on wages earned or income derived. They are not taxed for income made from Indian trust status lands. There have been no tribal taxes on Ft. Berthold Indians to-date.

## Agriculture

The trust status and taking area lands under BIA jurisdiction is broken down by user and use class on Table 11.

Cattle ranching is a primary industry on the reservation. In 1973 there were 44 operational Indian agricultural enterprises on the Ft. Berthold Reservation and 45 part-time Indian agricultural operations.

Planning is being initiated to incorporate tribal agricultural assets into enterprises that will stimulate the reservation's economy and produce employment for tribal members. Such enterprises might include feed confinement barns, methane production, fertilizer production, hydroponic greenhouses, grain mills, and irrigation.



Table 11  
CLASSIFICATION AND USES OF INDIAN LAND

<u>Use Class</u>	<u>Indian Used Acres</u>	<u>Non-Indian Used Acres</u>
Open grazing	252,206	83,002
Open grazing taking area	30,305	4,658
Timber grazing	10,830	-
Dry farming	17,720	53,669
Private Irrigation	122	-
Non-Agricultural	<u>1,088</u>	<u>-</u>
Total	312,191	141,329

SOURCE: Ft. Berthold Agency statistical data, Bureau of Indian Affairs.

### IMPACTS

Non-Indian population increases (expected to occur) on the Ft. Berthold Reservation would probably not be significant. Population impacts would occur mainly in the form of Indian population shifts between segments. Some Indians living away from the reservation may return to seek nearby coal related employment. The most probable pattern of population shifts would be from the north-eastern, western, and eastern segments of the reservation to the south segment known as the Twin Buttes community, since this community is closest to most of the Level 1 sites (ANG/Basin, NGPL) and within easy commuting distance.

Those Indians finding coal related employment caused by Level 1 development may wish to live in the Twin Buttes community with their families and commute to work. Others may wish to commute by bus or car pool from their present residences and still others may seek temporary housing for themselves only in Twin Buttes. This would depend on the amount and kind of housing available in the Twin Buttes community.

Assuming minority participation in the direct labor force at the present rate of 2%, Level 1 development could employ between 135-535 Indians (approximately 2-8% of the peak direct labor force requirements)(Meyers 1977). Using 3.5 as the number of dependents per Indian worker, this could mean a peak num-

ber of 1,876 persons relocating within the reservation. A more probable number might be 822 or 1% of the direct Indian labor force and their dependents.

It would be doubtful whether even the smaller number would be actually employed since no determination has been made as to the number of Indians who would qualify for and seek coal related employment.

The age/sex composition of reservation population is not expected to be significantly affected by Level 1 development. Considerable on or off-reservation migration of Indians is not anticipated. This is assuming that maintaining a reservation residence while employed in the coal related industry is a high priority among Indians as established by the Indian Lignite Manpower Project (1977) (see Table 12).

The number of Indians returning to the reservation to seek nearby coal related employment should not be significant but could slightly alter the population characteristics of the reservation.

Table 12  
RESIDENCE PREFERENCE

<u>Lignite employment choice</u>	<u>Live on the reservation</u>	<u>Commute alone one hr. daily</u>	<u>Commute in car pool or bus</u>	<u>Relocate to new residence near job</u>
Take a job. . . . .	66%	63%	72%	48%
Refuse a job. . . . .	17%	17%	12%	31%
Undecided . . . . .	17%	18%	13%	20%
No response . . . . .	-	2%	3%	1%
	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>

SOURCE: Indian Lignite Manpower Project 1977.

Assuming an Indian labor force participation between 2-8% of the total projected direct labor force, the cumulative projected direct Indian labor force would be between 135-535. If 5% or 335 Indians found coal related employment as a result of Level 1 development, the current reservation unemployment

rate of 35% might be reduced by as much as 30%. If a minimum 2% or 134 Indians found coal related employment, this would be a 12% reduction of reservation unemployment. Both these figures demonstrate significant short-term reduction of reservation unemployment but such a reduction may never be actualized due to a variety of factors. One would be the fact that the bulk of those classified as unemployed on the reservation would not possess the skills or education for lignite related employment. Another major factor would be that approximately half of the unemployed are women who might not desire the types of jobs offered in the lignite industry.

The most probable reduction of the unemployment rate would occur indirectly. Those now employed but earning less than \$7,000 a year would most likely abandon their present jobs and seek coal related employment if they could qualify. This situation would create more reservation jobs in the under \$7,000 income bracket which the majority of those currently unemployed could qualify for. Another situation which could drastically alter the reservation unemployment picture would be future changes in federal funding, since a significant share of reservation employment is currently created by federal programs.

Summer seasonal jobs for reservation young people and college students are in great demand. This need could be partially satisfied by lignite related employment. Bureau of Indian Affairs officials estimate an available seasonal labor force as high as 225 persons.

Indirect employment on the Ft. Berthold Reservation might occur as a result of Level 1 development. This would most likely take the form of small Indian businesses such as gas stations, groceries, and tackle and bait shops which could capitalize on increased tourism and recreation on the reservation. Another form of indirect employment would be in the construction of additional housing and community facilities which would occur most likely in the Twin Buttes community.

There would also likely be an increase in the number of part-time Indian farm or ranch operators who seek seasonal coal related employment.

The personal income of Indians on the reservation might show significant increases during periods of intensive off-reservation energy development, depending on the numbers of Indians finding coal related employment. However, if any significant increase in personal income occurs, it would be expected to occur for most Indians only in the short term.

Personal income for Indians will probably be derived from three main areas relating to energy development, direct employment in construction or operation of energy projects, indirect employment from construction or housing and community facilities, and from commercial enterprises such as groceries, gas stations, bait and tackle shops, and other businesses capitalizing on increases in population. Long term employment accruing to Indians in operational jobs would be expected to occur but not in significant numbers.

Level 1 development is not expected to have significant economic impacts on the agricultural sector of the Ft. Berthold Reservation. There may be Indians now farming and ranching who might abandon their agricultural operations permanently or seasonally to take advantage of coal related employment. This could increase the number of non-Indian operators on the reservation or the amount of land controlled by them.

The primary economic impacts of Level 2 development as it affects the Ft. Berthold Reservation would be in the form of increased employment opportunities and additional opportunities for Indians in the business sector.

Level 2 population impacts on the reservation would occur in a form similar to those described for Level 1 development but on a slightly greater scale.

Peak Level 2 Indian employment would involve between 144-576 Indians (2-8% of the peak projected direct labor force). This is a small increase in projected employment over the Level 1 development peak. Short-term reductions

in reservation unemployment would be expected to occur at about the same rate as with Level 1 development. Indirect employment generated by Level 2 development would be essentially the same as Level 1.

Personal income for Indians during Level 2 development would rise correspondent to employment levels.

The extent to which Level 3 development will economically impact reservation communities will depend largely on the type of labor market Level 3 development creates and the degree to which Indians become involved. Three of the Level 3 areas which have potential for coal development are located in Dunn, Mercer, and McLean Counties, all of which are within reasonable commuting distance of the reservation.

Impacts to the Indian business sector would probably not be substantial since Level 3 development is not expected to create the same level of population increase that is expected from Levels 1 and 2. Employment opportunities for Indians will exist but the number and type of jobs are not known at this time. However, any jobs that result from Level 3 development would reduce the reservation unemployment rate to some degree. It is expected that the eastern segment of the reservation (White Shield community) would experience employment and business sector opportunities created by the Level 3 development in McLean County to a greater degree than development associated with Levels 1 and 2.

The most intense impacts to the reservation economy should be in the form of reduced reservation unemployment at all levels of development. Increased Indian employment opportunities will be greatest with Levels 1 and 2 development.

Levels 1 and 2 development business sector opportunities which capitalize on non-Indian tourism and recreation activities will also increase.

Personal income of Indians on the reservation may fluctuate widely during the construction and operational phases of each level of development. The reservation unemployment rate might also fluctuate with seasonal changes in tourism and industrial operations.



## MITIGATION

The applicants have made commitments to hire local labor to the extent that qualified workers are available. This local labor force would include Indians living on or near the Ft. Berthold Reservation as well as urban Indians seeking coal related employment.

The Equal Employment Opportunity Act requires the hiring of minority applicants. If energy companies are found to be discriminating against Indian applicants a federal agency might sanction the hiring of a specified percentage of minority workers based on minority population percentages in the area. For example, the Indian population in Dunn County totals 8% of the county's total population. In Mercer County Indians comprise 1% of the county's population and in McLean County the figure is 4% of the total population (Numbers based on 1970 US Census. Actual percentages may be slightly higher.)

The Equal Opportunity Commission or a federal agency may, by law, implement a plan for hiring minority applicants over a period of several years until a quota which is comparable to the percentage of minority population in the area is met.

The energy companies might decide to contract with the Three Affiliated Tribes in order to obtain a quota of minority workers.

Mitigation measures for Levels 2 and 3 would be the same as those for Level 1.

The Indian Business Development Fund which receives state appropriations could provide financial and technical assistance to Indian businesses which are just beginning or trying to upgrade their operations.

State legislation could be passed to redistribute the reservation share of motor vehicle tax directly back to the reservation.

A tribal motor pool and/or bus system could be devised to make commuting to and from the gasification complex more convenient. Such assistance could encourage a larger number of Indians to take advantage of coal related employment.

Training for lignite industry jobs could be offered to Indians through tribal training and educational programs or programs could be developed through the United Tribes Educational Technical Center to qualify more Indians for energy related employment.

Additional avenues of funding might be found or created for encouraging the development of small businesses so that Indians could better capitalize on the coal related economy.

#### RESIDUAL ADVERSE IMPACTS

It is possible that Level 1 development could contribute a significant amount of short-term economic stimulation to the reservation's economy. Such stimulation may cause rapid fluctuations in income levels and employment rates which could cause a false sense of long term economic security.

Indian businesses capitalizing on increased tourism and recreation during short-term peak construction periods would likely experience economic hardships after termination of the construction phases of development.

Residual adverse impacts to the economic well-being of the Three Affiliated Tribes during Level 2 development would be about the same as those noted for Level 1 development.

Perhaps the only significant residual adverse impact from Level 3 will be its influence upon the political climate of the reservation, the ramifications of which are discussed under social impacts.

#### SHORT TERM USE VS LONG TERM PRODUCTIVITY

In the short term (the life of the projects) the economy of the reservation could receive significant stimulation as a result of coal related employment and business sector opportunities. Such stimulation would be dependent upon the level of Indian participation in the labor market, and on the extent that



Indians capitalize on the recreational and tourism opportunities created by Level 1 development. Unemployment levels could be reduced significantly in the short term but probably would not show any significant long term reduction as a result of Level 1 coal related employment.

Economic resources may be committed to Indian businesses providing indirect services in the short term but which there will be no demand for in the long term, unless a demand is created for them.

Increased employment coupled with Indian business sector expansion could bring a short term sense of security to the reservation economy and in so doing hinder serious long range economic planning.

If 20% or more of the reservation labor force became skilled in coal industry related jobs as a result of lignite manpower training or on-the-job experience, reservation economic development could be influenced more favorably toward establishment of a lignite industry on the reservation over the long run.

Level 2 development would have the same effects on the economy of the Ft. Berthold Reservation as Level 1 with slightly greater intensity.

In the short term Level 3 development could have some effects on the reservation economy depending upon the size and type of labor market it creates and the degree to which Indians participate in that labor force. Short term recreational and tourism business opportunities for Indians would not be expected to be significant since Level 3 development probably will not induce a large population change in the seven county area.

Level 3 development should create no long term commitment of reservation economic resources.

#### IRRETRIEVABLE RESOURCE COMMITMENTS

Some economic resources such as capital and business sector expansion of the reservation committed to mitigating impacts of Level 1 coal development would probably be irretrievable. This would also be true for Levels 2 and 3.

## ALTERNATIVES

If no further energy development occurred in the seven county area, the economy of the Ft. Berthold Reservation would be neither stimulated nor impacted. No increased employment opportunities for Indians would be anticipated. Indian income levels would probably show no significant increases as a result of coal related employment, nor would Indian business sector opportunities be increased. Population shifts on the reservation would not occur due to energy development.

If no federal coal were leased, Natural Gas Pipeline's gasification complex and mine would not be constructed. Under the no leasing of federal coal alternative anticipated employment levels for Indians would be significantly decreased.

If the Natural Gas Pipeline project were not constructed employment opportunities for Indians would be reduced by approximately 78 jobs in the vicinity of the reservation. The tourism and recreation business and other portions of the reservation's business sector would not be stimulated because the expected population influx to areas bordering the reservation would not occur.

Alternate timing of plant construction would serve to reduce population impacts significantly because it would require fewer workers and consequently cause less of a population increase. This could mean substantially fewer job opportunities for Indians. It would also mean less stimulation to the Indian business sector.

Changing location of two more energy projects could modify the anticipated economic situation on Ft. Berthold. If a major plant like ANG or NGPL were relocated a distance of ten or more miles further from the reservation it could mean fewer Indians would seek coal related employment because of the increased commuting distance. Locating projects further away from the reservation could also mean less recreation and tourism trade for the reservation. If, however, one or more plants were to be located nearer the reservation, employment opportunities

for Indians who wished to live on the reservation and commute would be increased. Also, the closer the new population concentrations are to the reservation the better the recreation and tourist trade opportunities would be.

## SOCIAL CONDITIONS.

### BASELINE INFORMATION

The existing Ft. Berthold social environment will be discussed by component in an attempt to determine the extent of the impacts from the proposed action on the reservation.

#### Health

Table 13 compares North Dakota Indian deaths by age group to death rates for the United States as a whole. The figures are indicative of the life expectancy of the Ft. Berthold Indian population. On the average, 6.4% of the 16-45 age group Indian population in North Dakota dies each year, which is over 3 times the U.S. rate (Harris 1975).

Table 14 gives Indian birth and death rates on Ft. Berthold for a fourteen year period. Indian births in 1975 by county show 14 Indian births occurring in Dunn County, 24 in McKenzie, 19 in McLean and 39 in Mountrail, for a total of 91 Indian births.

The Indian population by age distribution on the Ft. Berthold Reservation is shown in Table 15.

Leading causes of death on the reservation are depicted in Table 16.

Leading health problems for Indian residents of the Ft. Berthold Reservation are depicted in Table 17.

There are no hospitals located on the reservation. The Public Health Service maintains a large unit at Four Bears near New Town. This unit includes a pharmacy, clinical rooms, a laboratory, an x-ray unit, an emergency room, a dental clinic, and ambulances. The professional staff includes one doctor, one dentist, three physician's assistants, two clinical nurses, one Public Health Nurse, one LPN, one dental assistant, two pharmacists, one laboratory

Table 13

DEATH RATE PER 1,000 POPULATION BY AGE:  
NORTH DAKOTA INDIANS 1965-1976 AND UNITED STATES 1966

	North Dakota Indians	U.S.
Under 5	8.8	5.1
5 - 19	1.5	.6
20 - 44	6.4	2.1
45 - 64	17.2	11.6
65 and over	70.7	61.7

SOURCE: U.S. Department of Health, Education, and Welfare, Health Service, Indian Health Trends and Services (Washington, D.C.: Government Printing Office, 1971), p. 53.

and x-ray technician, and one mental health worker. The Public Health Service also maintains three clinical outposts in the more remote parts of the reservation (Figure 12). These are located in Mandaree, White Shield, and Twin Buttes. A physician assistant has been assigned to each of these posts and professional staff members from the Four Bears center visit each outpost one day a week by car or airplane.

Surgical cases or cases requiring hospitalization are handled in the local hospitals through a contract for services with the Public Health Service. Usually these cases are handled by hospitals in Garrison, Stanley, and Watford City. Special cases are also sent to Minot, Bismarck, and Rochester, Minnesota. Ft. Berthold's Public Health Service provides medical care to Indians only.

There are two nursing homes within the boundaries of the reservation. They are located at New Town and Parshall. The New Town nursing home has a capacity of seventy; as of October 1976 its total number of patients was

Table 14

## FT. BERTHOLD INDIAN POPULATION

## BIRTHS AND DEATHS

Year	Resident Births	Resident Deaths	Ratio	
			Births to Deaths	
1960	112	27	4:1	
1961	94	28	3:1	
1962	124	30	4:1	
1963	106	21	5:1	
1964	102	28	3:1	
1965	82	25	3:1	
1966	98	15	7:1	
1967	86	21	4:1	
1968	74	26	2:1	
1969	70	31	2:1	
1970	82	22	4:1	
1971	84	32	3:1	
1972	65	18	4:1	
1973	86	26	3:1	
1974	74	19	4:1	
14 year average	95.71	26.35	4:1	

## FIVE YEAR AVERAGES

Year	Resident Births	Resident Deaths	Ratio	
			Birth	Death
1960-1964	107.60	26.80	4.06:1	4:1
1965-1970	82.00	28.00	4.54:1	5:1
1971-1974*	77.25	23.75	3.35:1	3:1

\*The last column is a four year average.

Source: Indian Health Service estimated population count.



Table 15

AGE DISTRIBUTION OF INDIAN POPULATION ON THE  
FT. BERTHOLD RESERVATION

	Total	Under 16	16-24	25-34	35-44	45-64	65-over
Total	3,226	1,118	871	435	290	338	174
Male	1,634	575	440	220	146	168	85
Female	1,592	543	431	215	144	170	89

SOURCE: Aberdeen Area BIA Statistical Data, 1975.

Table 16

## LEADING CAUSES OF DEATH ON THE FT. BERTHOLD RESERVATION BY AGE

Cause	Age
Motor Vehicle Accidents	30-34
Cirrhosis of the Liver	60-64
Diseases of the Heart	65-69
Malignant Neoplasm	70-74

SOURCE: Aberdeen Area BIA Office, 1975.

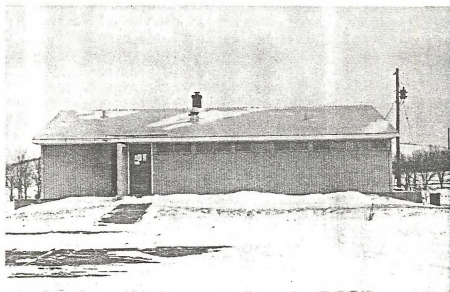
Table 17

## LEADING HEALTH PROBLEMS ON THE FT. BERTHOLD RESERVATION

Problem	Incidence
Respiratory System	2,246
Skin Diseases	716
Accidents and Poisonings	656
Ear Disease	497
Ill Defined	466
Mental Disease	79

SOURCE: Aberdeen Area BIA Office, 1975.

Figure 12



One of the clinical outposts maintained by the Public Health Service (in Mandaree).

sixty-four of whom twelve were Indian. The Parshall Nursing Home has only recently been completed.

Before inundation by the waters of the Garrison Dam in 1954, there was a governmental hospital facility on the reservation at Elbowoods. After the coming of the Dam, however, the facility was never replaced. Health care delivery to Indians on the reservation has, in general, greatly improved since construction of the Public Health Service units. Funds allocated to Indian Health programs in North Dakota experienced substantial growth since 1955. Per capita health expenditures rose from \$43 in 1955 to \$150 in 1971; however, many services are still needed.

The doctor-patient ratio is one physician per approximately 3,000 population which compares to a national doctor-patient ratio of one physician per 650 population. There is a great need for more doctors to service the reservation population. Indian doctors and other health professionals who understand the culture

and lifestyle of Indian people are in great demand. A Ft. Berthold Indian who is a second-year medical student has expressed a desire to return to the reservation to practice medicine after he has completed his residency.

Indian residents of Ft. Berthold have expressed a desire for a better, more efficient health service. When a member of the Three Affiliated Tribes requires hospitalization, except in cases of emergency, he must first have authorization from the director of Public Health Service to enter the hospital. This is an inconvenience which is time-consuming and difficult, especially for a person in poor health. Because the doctor-patient ratio is so low, the public health clinics are always crowded and Indian patients sometimes wait hours before receiving attention from a doctor. There is a strong need for a better home geriatric nursing program, as well as more extensive professional programs in the areas of prenatal care, family planning, diabetes care, and emergency medical education.

At present, these programs are handled by one Community Health Representative in each community on the reservation who provides the majority of these types of medical services.

#### The Family

It is difficult to determine the marriage and divorce rates for the reservation because the majority of Indian marriages do not occur on the reservation. In 1975, Tribal Court records revealed three marriages and 79 divorces (Crow's Heart 1975). It is probable that both marriage and divorce rates among Ft. Berthold Indians have not declined in recent years, however.

In relative terms, females are heads of North Dakota Indian families at a rate twice the national average and three times the state average. The reason for this phenomenon is due to dissolution of marriages, common law marriages, and non-marital situations in which children are involved being more common

among North Dakota Indians. Twenty-two percent of North Dakota Indian families have five children or more (Harris 1975).

Culturally, there have always been strong family bonds among the Mandan, Hidatsa, and Arikara. A family often consists of grandparents, uncles and aunts, and cousins living together in one household. Indian family ties are strong, which is a cultural tradition resulting partly from crowded living conditions. Grandparents, aunts, and uncles play an important role in disciplining and educating the children. Patterns of kinship among Indians are generally much closer than kinship among Anglos (Figure 13).

There are a variety of social service programs on the reservation available through a number of different agencies. The Bureau of Indian Affairs Social Services Department provides the following services: child welfare payment and assistance, general assistance to needy Indians, obtaining court commitments for alcoholism and institutional care, and administration of the commodity food program.

The Community Action program, which is funded through several federal agencies, also provides several social services programs. Among these are: the Ft. Berthold Aging Services, which is primarily a nutritional service, summer youth and recreation programs, and a community food and nutrition program which is a food multiplier program. There is a staff of 19 serving with these agencies.

Although Indian family ties are strong, the rate of suicide, alcoholism, and mental illness is believed to be higher on the reservation than in the nation as a whole. Indians today face many anxieties about the future. Tribal members are striving to develop more positive attitudes and optimistic convictions about self-sufficiency so that this objective may be attainable. Many of the current social problems are related to the economic plight of the tribes and progressive economic planning is being done to alleviate some of

Figure 13



The extended family is an integral part of the Indian culture. Often an Indian household includes grandparents, aunts, uncles, and cousins. This type of family structure has enabled Indians to pass on their culture and traditions for centuries.

anxieties caused by financial stress. Several entities within the tribe are involved with this economic planning. The Economic Planning Development Administration funds a planner and small staff. The tribe also has employed several people in a planning capacity.

### Public Safety

Crime is increasing on the Ft. Berthold Reservation. The crime rate among women has increased 10% in fiscal year 1976-77 (Baker 1977). Youth related crimes are also on the increase on the reservation. Table 18 delineates the number of Indian juvenile and adult offenses reported in 1975. A total of 51 juvenile offenders were handled by the Bureau of Indian Affairs Police organization and released in 1976. The BIA Law Enforcement staff consists of 10 police officers and one juvenile officer. According to White Buffalo (1977), the size of the law enforcement staff is not adequate to effectively administer law enforcement to an area as large and separated as the Ft. Berthold Reservation.

The facility, located in Mandaree (west segment, Figure 14), is headquarters for the tribal courts and jail, a 12 man facility for both male and female prisoners manned 24 hours a day. At the present time, there is no separate juvenile detention facility but, because of the relatively small prisoner load, the women's cell when vacant, is utilized for juvenile offenders. There is a new correctional facility located in Parshall (northeast segment) which holds 12 prisoners. White Shield (eastern segment) has a holding facility for six persons and is used for overnight detention. Enforcement facilities are adequate at present considering the reservation crime rate (White Buffalo 1977).

Tribal Court records for fiscal year 1976-77 indicate the following trends in criminal activities among Indians on the Ft. Berthold Reservation. An estimated 80-95 percent of the cases handled involved the use of alcohol. Sixty



Table 18

## INDIAN LAW VIOLATIONS ON FT. BERTHOLD - 1975

Classification	Number of Actual Offenses
Criminal Homicide	2
Robbery	3
Assault	58
Burglary	1
Larceny	10
Auto Theft	0
Arson	2
Forgery & Counterfeiting	2
Vandalism	34
Forcible Rape	0
Prostitution	0
Weapon Possession	1
Narcotics	0
Marijuana	0
Gambling	0
Offenses against family and children	30
Driving under the influence	39
Liquor	7
Drunkenness	0
Disorderly Conduct	157
Traffic violations	302

Source: Department of the Interior, Bureau of Indian Affairs,  
Aberdeen Area Office, 1975.

Figure 14



Tribal Court and Law Enforcement Headquarters for Ft. Berthold Reservation located in Mandaree (west segment).

percent of those incarcerated were unemployed and the other 40% were classified as low income. In 1975 all of the crimes resulting in death were attributed to the use of alcohol.

The State of North Dakota has no criminal jurisdiction over Indians on the reservation. Jurisdiction over criminal acts committed by Indians is provided for under the tribal law codes and prosecution occurs within the tribal judiciary system. There are, however, the exceptions of the thirteen major crimes (Table 19) which are prosecuted in federal courts as provided for under federal statutes.

It remains a question of legal interpretation whether or not the Tribes have within their sovereign powers the legal right to assume criminal jurisdiction over non-Indians on the reservation. Until the legal precedent has been set it is not expected that the Three Affiliated Tribes will actively attempt to assert criminal jurisdiction over non-Indians. In the past the Tribes have required non-Indians who purchase tribal hunting and fishing licenses to submit

Table 19

THE THIRTEEN MAJOR FEDERAL CRIMES

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Murder  
 Assault with a Deadly Weapon  
 Assault with Intent to Kill  
 Rape  
 Incest  
 Carnal Knowledge of a Female under sixteen  
 Burglary  
 Larceny (excessive)  
 Robbery  
 Arson  
 Manslaughter  
 Kidnapping  
 Negligent homicide

---

SOURCE: White Buffalo, BIA Ft. Berthold Agency.

themselves to tribal jurisdiction while hunting or fishing within the boundaries of the reservation. The Tribes have also required non-Indians who do business with Indians on the reservation to obtain tribal traders' licenses.

Presently, tribal and BIA law enforcement staff have worked through a system of cross-deputizing with county and city law enforcement personnel so that non-Indians who break laws on the reservation can be apprehended by the Indian police force and held for county or city law enforcement officials.

An Indian who commits a crime against a non-Indian on the reservation can be brought to trial in tribal or federal court by the non-Indian. If the situation is reversed and the non-Indian commits a crime against an Indian within the boundaries of the reservation, he can only be brought to trial in federal court under present law. The problem is further magnified where an Indian seeks civil recourse for a tort (offense involving civil action) committed upon

the reservation which does not involve a federal question. Most often the Indian plaintiff cannot find a forum to hear the case, much less a convenient one (Riechert 1977).

### Education

The Bureau of Indian Affairs Education Office records indicate 296 Ft. Berthold Indians received funds to attend college or trade school for first semester of 1976. Of these, 240 were full-time students and 65 were part-time. Approximately \$400,000 was received by these students from other sources of funding.

There are five elementary schools and four high schools existing on the reservation. They are as follows: New Town elementary and high school, School District #1, the total enrollment of which is 702 in grades kindergarten through 12th, with 338 being Indian. There are fifty-four on the teaching staff for a student-teacher ratio of 13:1. The Halliday School located in School District #19 has a facility housing both grade school and high school. Most of the Indian elementary students attend school in Twin Buttes. The total enrollment in the Halliday School system grades kindergarten through 12th is 245, of which 34 are Indians. The student-teacher ratio is 15:1.

The elementary school in Twin Buttes is operated cooperatively between the Bureau of Indian Affairs and School District #37. The total enrollment is 78 of which 74 are Indians. The teaching staff is composed of four teachers and eight half-time teachers' aides, for a student-teacher ratio of 9.5:1.

The Mandaree School is also cooperatively operated by the Bureau of Indian Affairs and School District #36 (Figure 15). The total enrollment for grades K-12, which is entirely Indian, is 190. The student-teacher ratio is approximately 8:1.

Figure 15



The Mandaree School (west segment) owned and operated cooperatively between the Bureau of Indian Affairs and School District #36. Similar schools are located in Twin Buttes (southern segment) and White Shield (eastern segment).

The Parshall elementary and high school is located in School District #3. The total enrollment in grades K-12 is 364 with 91 being Indian. The total teaching staff is 31 for a student-teacher ratio of approximately 12:1.

The White Shield School is also operated cooperatively between the Bureau of Indian Affairs and School District #85. It consists of grades K-12 with a total Indian enrollment of 107 and a student-teacher ratio of 7.7:1.

Only one college facility exists on the reservation. This is the Ft. Berthold Community College which headquarters at Four Bears near New Town. The college operates through a contract with Mary College of Bismarck. It offers an associates degree through accredited courses in general education, business and accounting, tribal government, and Indian languages and culture. It is expected that the curriculum will be developed to include other areas such as agriculture, natural resource management, and energy awareness when funding becomes available. The current staff is 14 with an enrollment of 56.

Indians are one of the more poorly educated groups in the country, a situation which has not changed over the last twenty years. In 1970, as in 1950, Indians ranked third among the six major minorities in terms of lowest educational achievement. The average level of educational achievement for all Indians in a federal school is five years of school. Dropout rates for Indians are twice the national average. Only 18% of the students in federal Indian schools go on to college, while the national average is 50%. Only 3% of the Indian students who enroll in college graduate; the national average is 32%. Only one out of every hundred Indian college graduates will go on to receive a Master's degree (American Youth Magazine 1971) (Table 20).

It is estimated that the average educational attainment of an adult Indian on Ft. Berthold is the 10th grade (Hudson 1977).



Table. 20

EDUCATIONAL ATTAINMENT OF POPULATION  
25 YEARS OLD AND OVER IN 1970:  
NORTH DAKOTA INDIANS, NORTH DAKOTA, AND UNITED STATES

Educational Attainment	North Dakota <sup>1/</sup> Indians	North Dakota <sup>2/</sup>	U.S. <sup>3/</sup>
Educational Attainment			
Elementary:			
Less than 5 years	14.9	4.1	5.5
5 to 7 years	16.7	8.9	10.0
8 years	21.2	25.7	12.8
High School:			
1 to 3 years	22.1	11.0	19.3
4 years	16.4	27.6	31.1
College:			
1 to 3 years	6.7	14.3	10.7
4 years or more	2.0	8.4	10.6
Percent High School graduates	25.1	50.3	52.4
Median School years	8.9	12.0	12.1

SOURCE: North Dakota Indian Reservation Economy, A Descriptive Study.

<sup>1</sup>Calculated from: U.S. Census of the Population: 1970, Vol. II, Subject Report, American Indians, p. 117.

<sup>2</sup>Calculated from: U.S. Census of the Population: 1970, Vol. I, Detailed Characteristics: North Dakota, p. 298.

<sup>3</sup>Calculated from: U.S. Census of the Population: 1970, Vol. II, Subject Report, Educational Attainment, p. 1.

Indian education on Ft. Berthold in general has shown improvement in recent decades, particularly in curriculum and facilities. Data on student status in BIA schools reveal a 96% completion rate through grade 12 on Ft. Berthold. There are, however, many more Indian educational needs to be met. In particular, the curriculum needs to be expanded to include Indian history, culture, and language. Attempts are being made to increase the number of Indian teaching staff for the benefit of non-Indians as well as Indians. Improved adult educational and vocational facilities are also needed.

#### Housing

There is a demand for more Indian housing on the reservation and for improvement of existing housing. These needs have been partially satisfied in the past through adding low rent public housing units, self-help programs, and distribution of scattered type homes. Housing conditions, however, are still crowded.

The Ft. Berthold Housing Authority maintains a total of 320 units on the reservation in housing developments, self-help homes, and scatter type homes (Figures 16 and 17) of which 200 are rental units. These housing programs were federally financed through the Department of Housing and Urban Development (HUD). There are also an additional fifty HUD scatter type homes approved for construction.

Low rental units are houses owned by the Housing Authority for which minimal rent is charged. The mutual self-help units can be obtained when the participant signs an agreement whereby he agrees to provide labor in constructing his home and also land on which to locate the house. After completion of the home he will occupy the home and land on a lease purchase basis until such time as the land and home are paid for. Scatter type homes are the same as self-help

Figure 16



Depicts low rental and mutual-help type housing in a housing development in the Mandaree community (west segment).

Figure 17



Depicts older housing in the Twin Buttes community (southern segment).

homes only they are usually constructed on a rural site, whereas self-help homes were usually constructed in towns or housing developments. A breakdown by community showing housing distribution appears in Table 21.

Special housing programs such as these were devised because Indians often have difficulty in obtaining the necessary credit and mortgages from conventional sources.

The Farmers Home Administration has made 41 rural housing loans to Indians on the reservation for home construction and improvement since 1970.

Housing conditions on the reservation remain crowded. In many cases, more than one family or an extended family live in the same household. The scatter type homes are located throughout the reservation, some in isolated rural settings. There are five main areas of housing development, located in Twin Buttes, Mandaree, New Town (2), Parshall, and White Shield.

#### Political Behavior

Indians on Ft. Berthold have the opportunity to vote in all state and national elections. In national and state elections, Indians most often vote for the candidates who are the most aware of Indian problems and sympathetic to them and whom they feel will best represent their concerns in state and federal government. The elections of primary concern to Indian voters are the Tribal Council elections and tribal referendum votes. The tribal government of the Three Affiliated Tribes is a democratic form of government consisting of a ten-member business council and tribal chairperson, all of whom are elected at-large.

The reservation is divided geographically by Lake Sakakawea into five distinct segments (Map 2). These segments are the political as well as the social reservation subdivisions. Each segment of the reservation is allotted a

Table 21

## FT. BERTHOLD HOUSING DISTRIBUTION

<u>Site</u>	<u>Low Rent</u>	<u>Self-Help</u>	<u>Scatter Type</u>
New Town	18	0	17
Parshall	45	0	8
White Shield	24	11	19
Twin Buttes	20	1	14
Mandaree	37	17	28
Drags Wolf Village	50	0	0

SOURCE: Ft. Berthold Housing Authority.

certain number of seats on the Tribal Council based on its population. The office terms are four years and are staggered so that a portion of the council is elected every two years.

### Religion/Ethnicity

There are presently 20 churches or church facilities on the reservation (Table 22).

Though many Indians today have adopted the Christian religion, the Indian religious beliefs are still very much a part of the culture and are practiced extensively. These religions were once considered to be pagan beliefs, but in fact are very similar in some ways to the Christian forms of religion (Figures 18, 19, and 20). The Native American Church holds regular services in the northern segment of the reservation which are attended by Indians from several states.

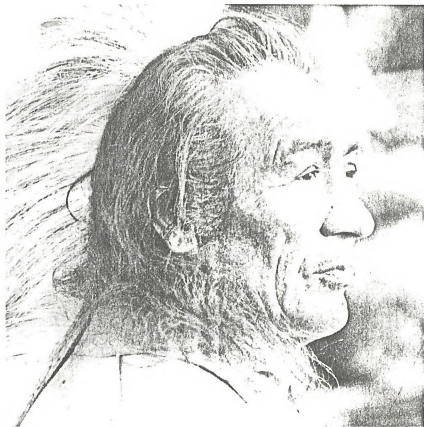
Table 22

## CHURCHES OR CHURCH FACILITIES ON THE RESERVATION

LOCATION	CHURCH
Mandaree	St. Anthony's Catholic Church
	Mandaree and Independence Congregational Church
New Town	St. Anthony's Catholic Church
	New Town United Church of Christ
	Snowbird Chapel and Shell Creek
	Church of Jesus Christ of the Latter Day Saints
	Bethel Lutheran Church
Parshall	Gospel Tabernacle
	St. Bridget's Catholic Church
	Parshall United Church of Christ
	The Lutheran Rural Parish
	First Lutheran Church
	Church of God Indian Mission
	Parshall Church of God
Twin Buttes	Evangelical Church of America
	Twin Buttes Congregational Church
	St. Joseph's Catholic Church
White Shield	Sacred Heart Catholic Church
	Arikara and Memorial

SOURCE: Schettler, et al.





Figures 18 & 19  
There is a strong cultural identity  
among young and old alike on the  
Ft. Berthold Reservation. Indians  
of all ages take part in age-old  
Indian traditions.



Figure 20



Indian celebrations (powwows) are the main form of group-based interaction for Indians on Ft. Berthold.

### Ft. Berthold Coal Development Attitudes

The membership of the Three Affiliated Tribes is very cautious in matters of energy development, particularly coal, having experienced the inundation of a fifth of their reservation by the waters of the Garrison Dam which is also in part an energy project. It is believed that at least three locations on the reservation contain vast amounts of potentially strippable coal. The Tribal Council, however, has issued a moratorium on all coal leasing on the reservation and has cancelled all existing leases. The Three Affiliated Tribes are in the process of conducting a complete inventory to determine the quantity and quality of all mineral and water resources existing on the reservation so the potential for mineral development can be determined.

The tribes' policy on mineral development is that development, if it occurs, should be done in such a way that the Three Tribes would receive maximum benefits with a minimum amount of damage to their environment.

At present, industrial development is not a popular topic among the reservation priorities because the Indians are experiencing more pressing needs in the areas of housing, education, and employment even though many of the problems associated with these subjects can be linked to a failing economy which stems from a lack of development.

The political as well as the social climate on the reservation is not currently conducive to sudden industrial growth or energy development. Any immediate impacts could put great stress on the tribal government and political systems and could have a devastating effect on the social climate.

Loss of land base is perhaps the most significant concern of most tribal members. However, since this development is occurring off the reservation, air quality deterioration and non-Indian encroachment would appear to be the areas of primary concern.

## IMPACTS

Depending upon the realization of potential for community and housing development in those Indian communities closest to Level 1 development sites, primarily Twin Buttes and Mandaree, there could be Indian population shifts between reservation segments caused by availability of coal related employment. Should significant shifts occur (10-30 families) the Public Health facilities in those segments may need to be open more than two days a week. Additional Public Health staff may be needed to accomplish this.

If crowded conditions occur in the Hazen Hospital due to population increases associated with Level 1 coal development, the Public Health Service may no longer be able to contract hospital services for Indian patients there. This would necessitate the placement of Indian patients in hospitals farther away from the reservation.

Some Indians who obtain coal related employment may seek private medical care and pay their own medical expenses. This would slightly decrease the case load for the Public Health Service.

Impacts to the Indian family structure may not be measurable. There could be a slight decrease in the Indian divorce rate as an indirect result of coal related employment since many Indian marriages are now dissolved indirectly as a result of financial stress. More inter-racial marriages might occur as a result of increased social interaction with non-Indians. This would serve to reduce the Indian blood quantum significantly in future generations of Indians as it has in the past.

As income levels rise some Indians may adopt a more materialistic way of life and might even abandon some Indian traditions which now closely link family members.

Social service agencies and their programs would be expected to experience a slight-to-significant decrease in case loads because as their income level rises some Indians may no longer require the services provided by such agencies.

If the projected 15% population increase in the seven county area occurs there will be increased non-Indian encroachment onto the reservation in the short term. Even without development a measurable amount of this type of encroachment already occurs.

An increase in non-Indian visitation on the reservation could add to the severity of legal jurisdictional issues, the primary issue among these would be tribal jurisdiction over non-Indians committing crimes against Indians and Indian property.

If there is a significant increase in the occurrence of crimes such as those traceable to non-Indian encroachment a serious problem could result since the Three Affiliated Tribes currently doesn't assert jurisdiction over non-Indians within the reservation boundaries.

An increase in law enforcement staff of from 1 to 5 persons reservation wide might be necessary to adequately monitor law enforcement problems in the short term.

Level 1 development could impact some elementary and secondary schools on the reservation depending if and where changes in population distribution occur. A significant population shift between reservation communities is considered to be 25 or more persons. The highest probable population shift would be approximately 250 people changing residence. Perhaps the only Indian community which would experience a significant increase in school age population during the short term would be Twin Buttes, since it is relatively close to the ANG/Basin and NGPL sites. Additional elementary classroom space would be needed to absorb 10 or more new students. An increase in enrollment of over 20 students would require additional teaching staff to maintain the existing student-teacher ratio of 20:1. A minimum of two additional classrooms would be required since the current system incorporates one classroom to every two grades.

More Indians may seek training to obtain lignite related skills and qualify for employment in the energy industry. If the energy companies actively recruit and employ Indians, this situation would likely occur. Therefore, such



Indian training programs as the Division of Native American Programs, Indian Action Team, and Indian Lignite Manpower may become more extensively involved in training for coal related employment.

The severity of many of the impacts, discussed in the family, public safety, and education sections, hinges on impacts that could accrue to Indian housing and the extent to which they can be effectively mitigated. The size of the population shifts between segments would also depend on the number of additional housing units available.

Again, because of its proximity to four of the Level 1 development sites (ANG, NGPL, Basin, Coyote 2) the Twin Buttes community would likely receive a larger share of the reservation population. The community of Twin Buttes may be developed in the short term both residentially and commercially if significant population migration to that reservation community occurs.

Level 1 development could probably bring about the employment of 200 Indians. Assuming that 7.5 housing units would be needed for every ten immigrating workers, as high as 50 new housing units might need to be constructed, most likely in the Twin Buttes community. However, not all Indian workers will require housing on the reservation, some may desire to live in company construction camps or in off-reservation cities near their work. The projections stated are based on peak employment and are short term in nature which would indicate that much of this housing would need only to be temporary in nature.

Level 1 development could have significant effects on the political behavior of the Three Affiliated Tribes. The Tribal Council may have to deal with issues of intense magnitude in the short term such as severe housing shortages in some reservation segments, caused by population shifts, and they may also find increased problems relating to jurisdiction over non-Indians.

As tribal members become more aware of the ongoing development which surrounds the reservation they will likely become more concerned about water rights and future energy development on the reservation in the long term.

Christian forms of religion and church facilities will not be expected to experience any significant impacts in terms of Level 1 coal development. However, some of the Indian religious traditions that are integral parts of the Mandan, Hidatsa, and Arikara culture may be lost due to increased social interaction with non-Indians.

Level 2 social impacts to the Ft. Berthold Reservation would be expected to be much the same as those predicted with Level 1 development. Some specific impacts such as housing shortages, increases in crime rates, and shortages of educational facilities would be slightly more severe. From 6-8 additional classrooms could be needed. An increase in law enforcement staff of at least 20 officers may also become necessary.

Correspondent to population shifts, additional housing units needed in Twin Buttes could be as many as 60 more than are presently available.

Impacts to political behavior, family structure, religion and culture may occur with slightly more intensity during Level 2 development.

Level 3 development includes areas defined as having a potential for coal development. Three of these areas are within thirty miles commuting distance of the reservation. They are located in McLean, Mercer, and Dunn Counties (Map 10). These are the Garrison, the Hazen-North Beulah, and the Dickinson-Dunn areas.

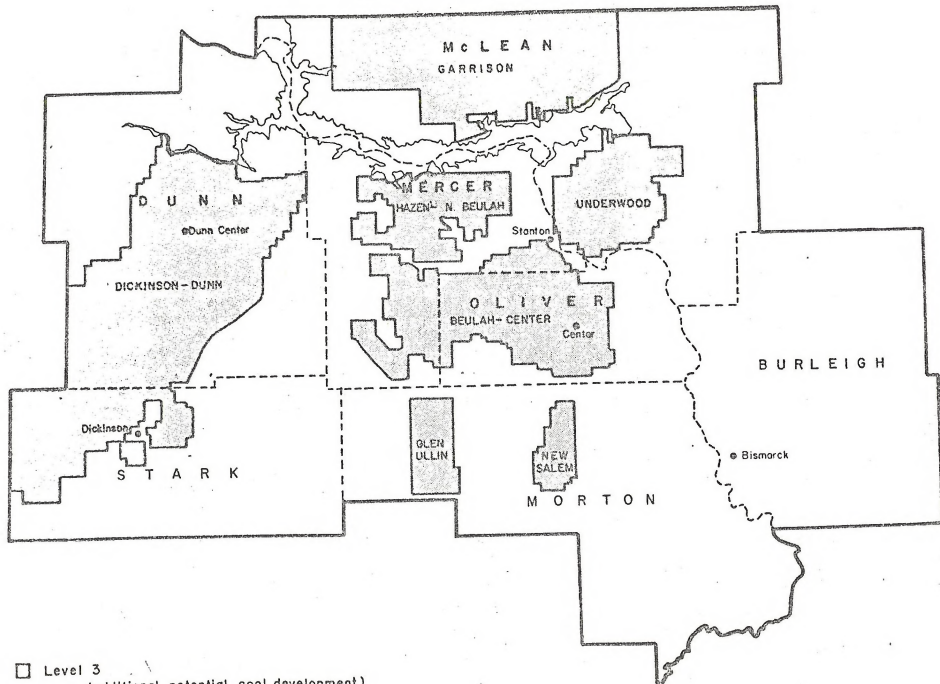
The extent to which Level 3 development would socially impact reservation communities would depend largely upon the amount and type of labor market generated by Level 3 development.

It is possible that significant numbers of Indians could be employed in Level 3 development but the numbers would likely be substantially smaller than during peak employment periods noted under Levels 1 and 2 development.

Reservation housing requirements would probably not be altered significantly under Level 3 development. There could be a need for additional units in



LEVEL 3 DEVELOPMENT AREAS



the White Shield community to house Indians employed in the McLean County development.

Impacts affecting Indian family safety, political behavior, and religion/ethnicity would be expected to occur but not with the severity of Levels 1 and 2 development.

Social impacts to the Ft. Berthold Reservation will occur with all levels of development. Only one reservation community, Twin Buttes, would suffer serious crowding of educational facilities as a result of Levels 1 and 2 development.

Non-Indian population increases associated with Levels 1 and 2 development in the seven county study area would cause the most intense impacts to culture, political behavior, and public safety on the reservation.

Slight-to-serious housing shortages may occur at all levels of development which in turn is due to population shifts caused by Indians seeking coal related employment.

#### MITIGATION

Until jurisdictional issues of non-Indians on the reservation are litigated, cross-deputizing between tribal and county law enforcement officials might be the most feasible method of controlling the crime rate on the reservation. The Tribal Council may take a direct approach and begin to actively assert jurisdiction over non-Indians on the reservation.

State school districts on the reservation that are impacted may receive financial aid from the State Coal Impact Office if the Attorney General's ruling is favorable to such monetary distribution.

The Public Health Service units in impacted reservation communities may need to be open more than one day a week, a situation which could require that additional staff be hired.

The energy companies could provide or subsidize a number of additional temporary housing units in reservation communities such as Twin Buttes so that more Indians might be able to take advantage of coal related employment.

Rural water and sewer systems for additional housing units in a reservation community could be obtained through the Farmers Home Administration and the Environmental Protection Agency via the Rural Development Act of 1972 (Ross 1977).

County Commissions or Impact Boards could include Indian members to represent the reservation.

Mitigating measures with Level 1 development would be applicable to Levels 2 and 3.

#### RESIDUAL ADVERSE IMPACTS

Residual adverse impacts to the social environment of the Ft. Berthold Reservation which probably could not be mitigated would involve an increase in social interaction with non-Indians, further loss of culture and tradition stemming from adaptation to a more materialistic way of life, and changes in the reservation political climate involving such issues as water rights, tribal jurisdiction, and reservation coal development.

Residual adverse impacts for Level 1 development would also occur with Level 2 development. Residual adverse impacts to the Ft. Berthold Reservation with Level 3 development would occur mainly in the form of changes in the political climate and a continued and increased social interaction with non-Indians.

#### SHORT TERM USE VS LONG TERM PRODUCTIVITY

In the short term, one or more communities on the reservation may be impacted by housing and educational facility shortages. Whether or not this short term (6-10 years) impactation will warrant the building of additional facilities will be the decision of those communities experiencing impacts.

It will also depend largely on avenues of funding available for construction of additional facilities. Some added facilities may not maintain their usefulness over the long run. Rapid community development that could occur in short run may not be fitted to long term community needs.

Level 2 development would have the same effects on the long term social conditions of the Ft. Berthold Reservation as would Level 1.

Level 3 development should have no short term impacts which would significantly affect the long term productivity of the reservation social environment.

#### IRRETRIEVABLE RESOURCE COMMITMENTS

The irretrievable resource commitment of the Ft. Berthold Reservation would mainly take the form of a loss of human resources. Indians employed in energy development off the reservation will be lost to social development on the reservation. Their skills and efforts would be directed toward the extracting and processing of energy minerals instead of the betterment of their own Indian society.

Indian religious or cultural traditions lost due to increased social interaction with non-Indians and adaptation to a more materialistic way of life would never be regained. This would constitute a loss of an invaluable social resource.

Irretrievable resources lost with Level 1 development would also be expected to be lost with Level 2 development and also with Level 3 development.

#### ALTERNATIVES

If no further expansion of the coal industry in the seven county area were to occur beyond those projects presently existing, there would be no significant impacts to the Ft. Berthold Reservation. Increased social interaction would not be expected to increase to the level at which it would occur

with development. Changes in social structure or loss of culture would not occur due to energy development. Jurisdictional issues between the Three Affiliated Tribes and state government would not be expected to be as intense.

## LAND USE

### BASELINE INFORMATION

Land use on the reservation changed abruptly with the filling of Garrison Reservoir (Lake Sakakawea). Prior to the construction of Garrison Dam, 90 percent of the reservation population (excluding the Homestead Area) resided in small villages located on the rich bottomlands of the Missouri River. These bottomlands provided for the population's needs through a combination of farming, ranching, and living off the land. There were numerous springs and creeks for water supplies; fields received both flood and subsurface irrigation from the Missouri River; exposed coal veins and wood provided fuel. The woods provided logs for construction, fence posts, winter protection for livestock, wild fruits and berries, game, and furs. To clear the way for the reservoir, the people were relocated in the highlands of the reservation and forced to change their way of life from a subsistence type of economy to a cash economy.

Over half the resources of tribal trust lands were lost. Most of the population remained and increased. The existing social structure was destroyed because rather than relocating entire villages, each family's home was placed on its own land allotment. Neighbors were changed and the entire membership of the existing social organizations was scattered throughout the reservation. Eighty percent of the road system was lost and only partially replaced. The splitting of the reservation by the reservoir into separate segments without a direct means of transportation between them has caused difficulties in land and tribal administration and land use.



Eighty percent of the Ft. Berthold Reservation land, excluding the Homestead Area, is classified as grassland primarily suitable for grazing and/or haying. Over 331,000 acres of the trust land is used for rangeland and is included in range units with a total year-round carrying capacity of 12,214 head of cattle (as of 1967). The "taking area" lands provide an estimated additional 40,000 acres with a carrying capacity of 1,430 head of cattle. In addition, approximately 350 head of cattle are grazed on 10,000 acres of farm pastures not included in the grazing units. This brings the total to 381,000 acres of reservation land used as rangeland. This figure does not include the Homestead Area, for which such information was not available.

Approximately 19 percent of the 71,256 acres of land under BIA jurisdiction was being farmed in 1967. Table 23 shows the breakdown between Indian and non-Indian use of this farmland.

The dominant land use in the Homestead Area is raising small grains and improved forage crops under dryland farming conditions. Significant amounts of land are also used for pasture and native hay production.

The reservation also includes land used for dwellings, roads, and other structures and improvements, some oil wells, recreation, hunting (seasonal, year-round to Tribal members and prohibited to non-members), and other uses.

#### Geography and Transportation Systems

Lake Sakakawea (formerly Garrison Reservoir) has divided the reservation into segments between which transportation and, therefore, personal communication is difficult. Because of access problems, the trade and shopping patterns of the various segments are different.

Table 23

FARMLAND USE, FT. BERTHOLD RESERVATION  
(Excluding the Homestead Area)

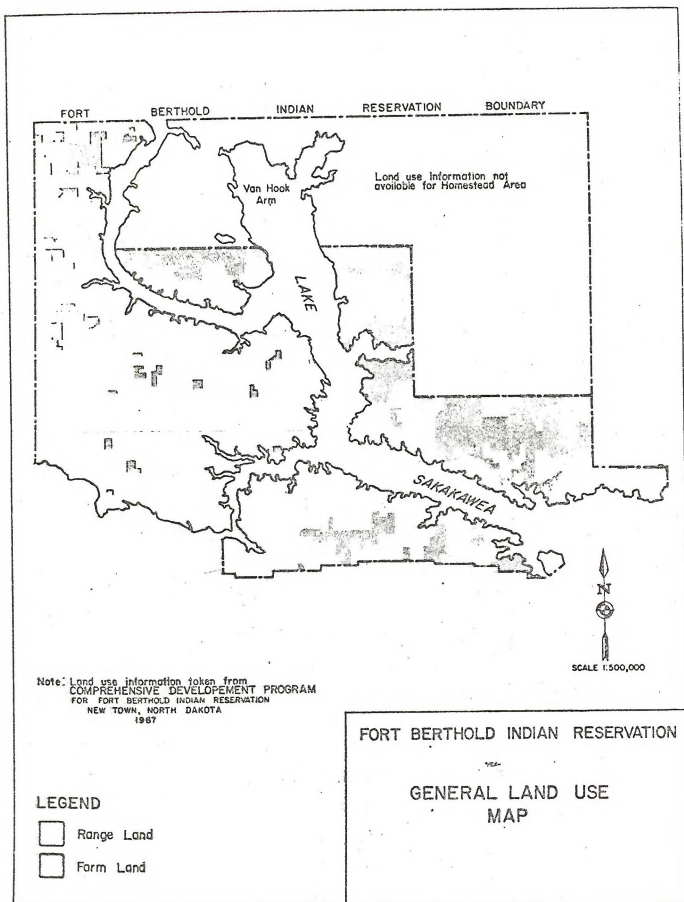
Controlled By	No. of Acres
Indian Used Acres	17,793
Non-Indian Used Acres	53,463
TOTAL FARMING ACRES	71,256

SOURCE: Ft. Berthold Agency statistical data,  
Bureau of Indian Affairs.

Sections of the Ft. Berthold Reservation, separated by Lake Sakakawea, are located in western McLean County and northern Dunn and Mercer Counties. These portions of the reservation are within the study area and contain considerable amounts of badlands and hardwood draws, especially the Twin Buttes and Mandaree segments.

There are no established towns within the diminished reservation boundary because of relocation caused by the filling of the reservoir. There are, however, three rural community centers, each with a school, police force, and roads maintenance facilities. These are White Shield in the eastern segment, Twin Buttes in the southern segment, and Mandaree in the western segment. After the reservation was divided by the reservoir, there was no location for an agency office which could satisfactorily serve all segments. Finally, since the only bridge in the area which crossed the Missouri River was located 3 miles west of the newly-established town of New Town, a decision was made to build the new agency office at New Town, off the diminished reservation but within the Homestead Area (Map 11). New Town is now the center of Indian activities of a tribal or federal nature on the reservation.

Map 11



The cities of Stanley, Watford City, and Killdeer provide shopping for Mountrail, McKenzie, and Dunn Counties, while McLean and Mercer Counties depend, to a large extent, on the larger more distant cities of Minot, Dickinson, and Bismarck.

Secondary marketing of agricultural products and the transportation and communication facilities of the area are oriented almost exclusively to the Minneapolis-St. Paul metropolitan area which lies some 500 miles to the southeast.

The general area is well-serviced by federal, state, and local roads. However, a road network capable of fully serving the needs of all Indian ranch families and providing access to potential recreation sites on the reservoir is still in the planning stage. Transcontinental U.S. Highway No. 2 traverses the northern portion of Mountrail County, while North Dakota Highways 23 and 7 provide east-west primary traffic facilities for the northern and southern portions of the area. U.S. Highways 85 and 83, as well as North Dakota Highways 22, 8 and 37 provide north-south facilities. Daily passenger bus service is available along US 83 and State Highway 23.

The mainline of the Burlington Northern Railroad bisects the northern portion of Mountrail County and provides branchline freight service to the Watford City area. A branch of the Soo Line Railroad provides freight service to the towns of Garrison, Parshall and New Town. A branchline of the Burlington Northern provides similar service to the southern towns of Beulah, Hazen, Halliday, and Killdeer. Amtrak passenger service is available at Williston and Minot to the north of the reservation and Dickinson and Bismarck to the south.

Scheduled trucking routes of commercial motor carriers service towns on and near the reservation and will pick up at other points both on and off the reservation when volume justifies. Local private trucking services are readily available on a contract basis. Oil transport companies deliver to all points within the area. Most retail firms receive their goods from suppliers with company trucks.

Scheduled airline passenger and freight service is available in the perimeter towns of Williston, Dickinson, Minot, and Bismarck. Secondary municipal airport facilities are available at Hazen, Beulah, Watford City, Stanley, New Town, Parshall, and Garrison.

Since about 1900, commercial water transportation in the area has been insignificant. Although conjecture is frequently heard on the possibility of utilizing various reservoirs on the upper Missouri for navigation, no plans have been made for such development.

Electric power is supplied by Montana-Dakota Utilities Company, the Otter Tail Power Company, and five rural electric cooperatives. Montana-Dakota Utilities has a main line transporting processed natural gas to Watford City, Stanley, and Garrison, but no pipeline gas is available on the reservation.

Local telephone service is provided by Reservation Telephone Cooperative, while trunk line service is provided by Northwestern Bell.

The Three Affiliated Tribes have under consideration a draft zoning ordinance which would establish six types of zoning districts: Agricultural, Residential, Commercial, Industrial, Recreation, and Reservation-Restricted. No action on the ordinance is expected in the near future.

#### Land Ownership

Reservation land ownership is summarized in Table 24. Ownership in the Homestead Area is predominantly patent and fee lands, with some Corps of Engineers owned land in the reservoir taking area; a small amount of tribal trust land in and near Parshall; and a half section of BIA submarginal lands in Section 16, T150N, R88W.

Table 24

## LAND OWNERSHIP, FORT BERTHOLD INDIAN RESERVATION

Description	Acreage
Diminished Reservation	
Tribal (trust)	57,954.20
Allotted (trust)	360,438.57
Government	164.09
Fee Patent (alienated)	<u>55,865.14</u>
Subtotal	474,422.00
Reservoir Taking Area	152,359.95
Homestead Area	<u>353,792.59</u>
TOTAL AREA	980,574.54

Sources: Real Property Management Reports and Controls, Forms 5-118 and 5-152, Memorandum to Superintendent from Realty Officer, October 20, 1970.

Form 5-152, Annual Report of Caseloads, Acreages Under BIA and Surface Leasing, Fort Berthold Agency, June 30, 1975.

IMPACTS

Permanent change in reservation land use would probably occur only if Indians from other reservations or from the Ft. Berthold Reservation relocate in the Mandaree or Twin Buttes segments in order to take advantage of employment opportunities at Level 1 project sites. The Mandaree and Twin Buttes segments are the only parts of the reservation within reasonable commuting distances. Increased traffic volumes could probably be expected on State Highways 8 and 22. Demands for new residences or other development, particularly in the Twin Buttes segment, could lead to adoption of the reservation's proposed zoning ordinance.

Tentative Level 2 projects could encourage relocation of reservation Indians to the Twin Buttes and White Shield segments, both of which are located within commuting distance of the Nokota, Coyote 2, Renner's Cove, and Dakota Star projects. Travel to these sites and to other Level 1 sites would add



traffic volume to the state highway access routes on the reservation. The magnitude of land use and transportation impacts on the reservation would depend on the number of Indians employed by the projects. Indians could occupy from 2% to 8% of the jobs created by the active and tentative project proposals.

Impacts that would affect Ft. Berthold land use and transportation resulting from Level 3 coal development would depend on how many Indians were employed and the location of their employment. Low employment rates would reduce Indian relocation to reservation segments near possible development. Locations beyond reasonable commuting distances would also contribute to lower Indian employment and relocation.

#### MITIGATION

Adoption of the proposed Ft. Berthold zoning ordinances could help promote sound planning and land use regulations on the reservation. It would also mitigate impacts from non-Indian trespass and the sudden growth of any reservation communities.

#### RESIDUAL ADVERSE IMPACTS

No adverse impacts to reservation land use patterns, as a result of proposed development, are foreseen that could not be effectively mitigated.

#### SHORT TERM USE VS LONG TERM PRODUCTIVITY

Short term energy development should not have significant effects on the long term uses of reservation land unless coal development off the reservation were to indirectly influence mining on the reservation.

#### IRRETRIEVABLE RESOURCE COMMITMENTS

No irretrievable land use changes on the reservation would occur as a result of the proposed development.

## ALTERNATIVES

The no further development alternative would leave land use patterns on the reservation the same as described in baseline information. No rapid development of Indian communities would occur. No changes in transportation patterns would be necessary.

The no federal coal leasing alternative would prevent construction of the NGPL plant and mine. If this were to occur there would not be as significant an increase in the population of the Twin Buttes community because of fewer employment opportunities in the southern segment of the reservation. Commuting from the reservation to the Dunn Center area would not increase.

The other two alternatives, alteration of construction and operation schedules and project modification, would not cause significant changes in the magnitude of reservation community development or transportation (commuting) patterns but could affect timing.

## SUMMARY

It becomes obvious from the preceding report that although none of the proposed actions discussed is located on the reservation, impacts stemming from several of these proposed energy projects will have impacts on those portions of the reservation which are situated within commuting distance of the projects.

Impacts would accrue to the social as well as physical environments of the Ft. Berthold reservation. Possible physical impacts would occur mainly in the areas incurring a slight degradation of air quality, possible toxic effects on vegetation and animals, damage to underground water aquifers, a loss through usage of surface water, loss of natural areas and wildlife due to increased numbers of recreators and tourists, and possible destruction of Indian burial sites and antiquities.

Impacts affecting the social and economic environments would occur in the forms of increased social interaction with non-Indians, increased coal related employment opportunities for Indians, and possible population shifts to the southern and eastern segments of the reservation which are nearest to a majority of the proposed developments.

The extent to which the physical, social, and economic environments of the reservation are impacted by the seven county development will depend largely on how they prepare for these impacts. Mitigating measures, such as enactment of proposed reservation zoning ordinances, may alleviate some of the undesirable impacts such as increased non-Indian encroachment. Economically speaking, the Three Affiliated Tribes may be able to take advantage of certain coal related impacts such as increased tourism and recreators which could increase the recreation industry on the reservation substantially. If Indians sought training now for positions related to the coal industry they could become qualified to hold high-paying coal related jobs and have the opportunity to commute to work from their homes on the reservation.

Perhaps the most important impact the proposed seven county development will have on the reservation will be on the political climate of the Three Affiliated Tribes as a governing body. Within the reservation there are at least three major areas with strippable lignite deposits and several smaller reserve areas. There is also enough surface water to process the coal into any energy form including electricity and synthetic natural gas. The pressure from industry for the Three Affiliated Tribes to enter the coal industry on a large scale will no doubt continue to grow. Dependent upon the extent to which the off-reservation development impacts the reservation environment and dependent upon the types of impacts the proposed development demonstrates to the people of the Three Affiliated Tribes, political attitudes on the reservation will be either influenced more favorably or unfavorably toward future coal and energy industry on the reservation.

APPENDICES

## STATUS OF FT. BERTHOLD EXTERIOR BOUNDARIES

From the time of establishment of the Fort Berthold Reservation in 1891, subsequent Acts of Congress and Executive Orders have affected the specific land areas of the Reservation. Some of those Acts and Orders have affected a reduction in the size of the reservation.

It has been judicially determined, however, that the exterior boundaries of the Fort Berthold Reservation remain today as they were established pursuant to the Act of June 10, 1910, 36 Stat. 455. That determination was made in City of New Town v. United States, 454 F.2d 121 (8th Cir. 1972). The case determined that the 1910 Act merely opened some of the Reservation north and east of the Missouri River to homesteading and did not effect a reduction of the area or an alteration in the exterior boundaries of the Reservation as established by the Act of March 3, 1891, 26 Stat. 1032.

The fact that some legal question has in the past been raised that the northeast portion of the Reservation was no longer within the exterior boundaries led some persons to act on the wrongful assumption that that area was not part of the Reservation. Some of the studies relied upon in this report were based on that erroneous assumption.

It was necessary to refer to those earlier studies in this report. In order to facilitate reference to them, it was further necessary to use their descriptions of (1) "homestead area," and (2) "reservation proper" or "diminished reservation," when discussing the (1) opened area and the (2) unopened area, respectively. These terms should not be construed as any endorsement by the Three Affiliated Tribes of the Fort Berthold Reservation that the Reservation was in fact diminished by the 1910 Act.

The legal question is judicially closed and the status of the reservation as established in 1891 therefore remains the same today.

NOTE: Prepared by Wilkinson, Cragun, and Barker, Legal Counsel for the Three Affiliated Tribes.



# NORTH DAKOTA INDIAN AFFAIRS COMMISSION



16TH FLOOR  
STATE CAPITOL  
BISMARCK, NORTH DAKOTA 58505

July 12, 1977

GOVERNOR ARTHUR A. LINK  
CHAIRMAN  
PHONE  
701-224-2200

JUANITA J. HELPHREY  
EXECUTIVE DIRECTOR  
PHONE  
701 221-2428

WHEREAS, The West-Central North Dakota Regional Environmental Impact Statement is addressing energy related impacts in a seven county portion of west-central North Dakota and,

WHEREAS, This area also includes the Ft. Berthold Indian Reservation which is governed by the Three Affiliated Tribes and,

WHEREAS, The Indian Affairs Commission has been designated as a cooperating contact agency for preparation of the impact statement and,

WHEREAS, The public concerns of Indian community members on the reservation areas have been solicited by Regional Environmental Impact Statement and Bureau of Land Management personnel and,

WHEREAS, A primary concern of reservation community members was that Indian concerns about coal impacts not be generalized in with non-Indian concerns and,

WHEREAS, Indian community members tribal and government agencies are desirous of a convenient compiled impact statement on the Ft. Berthold Reservation for dissemination and use and,

WHEREAS, NEPA guidelines do not delineate specific format for treatment of Indian reservations within impact statements such as this and,

WHEREAS, The present format used is inconvenient for those interested only in Indian impacts,

NOW, THEREFORE, BE IT RESOLVED THAT

The North Dakota Indian Affairs Commission hereby requests that the Regional Environmental Impact Statement Office and the Bureau of Land Management compile a separate technical report of energy impacts related to the Ft. Berthold Reservation for dissemination to the Three Affiliated Tribes and all parties interested solely in Indian impacts.

## CERTIFICATION

The foregoing resolution was adopted by the North Dakota Indian Affairs Commission, a quorum being present, during a quarterly meeting held on June 23, 1977 at Belcourt, North Dakota.

Governor Arthur A. Link, Chairman, NDIAC

ATTEST: Anton Moran  
Secretary, NDIAC



# STATE OF NORTH DAKOTA

EXECUTIVE OFFICE

BISMARCK

ARTHUR A. LINK  
Governor

September 22, 1976

Ms. Juanita Helphrey, Executive Director  
Bureau of Indian Affairs Commission  
State Capitol  
Bismarck, North Dakota 58505

Dear Ms. Helphrey:

During a briefing with the Regional EIS State Agency staff people hired under the Old West Regional Commission grant, I noticed the wide variety of agencies that these staff people must coordinate with. I was assured that each agency had been involved in the selection and in the placement of these employees so that they have the broadest opportunity to assure state input into the Regional EIS.

I do want to share with you, that it is important in your day-to-day assessment of priorities to recognize the importance of assigning additional state employees to work on the Regional EIS where appropriate and timely. The analysis of the accumulative effects by this Regional EIS effort is one of the high points of my Energy Policy. I feel that it is necessary that you give it high priority in the utilization of your agency's skills.

We have an excellent start and the opportunity is clearly there for the State of North Dakota to exercise a full partnership role in this analysis.

Thank you for your cooperation.

Sincerely yours,

A handwritten signature in cursive script that reads "Art Link".

ARTHUR A. LINK  
Governor

AAL: ip

## REFERENCES

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## ACKNOWLEDGMENTS

Information utilized in the Regional Environmental Impact Study and this Technical Report was provided by the following organizations and individuals.

### ECONOMIC CONDITIONS

Bureau of Indian Affairs, John Danks, Reservation Programs Officer;

Marilyn Hudson, Administration Officer; George Abe, Range Specialist; Ben Kirkaldee, Director Trust & Natural Resources; Larry Burr, Realty Specialist; James Danks, Mandaree Range Specialist; Kenneth Fredericks, Trust & Natural Resources; Simon Stevens, Environmental Coordinator; Wilfred Bird, Twin Buttes Sub-Agency Director.

Community Action Program, Thomas Crows Heart, District Supervisor; Nell Bozenney, Reservation Director Farmers Home Administration; Ellis Ross, County Supervisor, Three Affiliated Tribes; Samuel Little Owl, Tribal Council Member; John Stone, Tribal Council Member; Mike Lincoln, Member; Willard Little Owl, Member.

Three Affiliated Tribes Department Fish, Game and Recreation, Adrian Foote, Director

North Dakota Job Service, Carmen Eagle, Supervisor

Three Affiliated Tribes, Shiglee Mason, Comptroller

Industrial Development Division, Carl Whitman, Executive Director

Manpower Tribal Division, Warren Chase, Assistant Director

Indian Action Task Force, Laurin Baker, Director

Indian Lignite Manpower, Doug Meyers, Director; Arnie Guimont, Assistant

North Dakota Indian Affairs Commission, Juanita Helpfrey, Executive Director

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Indian Action Team Task Force, Barbara Lindley, Assistant

## SOCIAL CONDITIONS

Bureau of Indian Affairs, John Danks, Reservation Programs Officer;

Marilyn Hudson, Administration Officer; Arden Fisher, Director Human Resources; Joseph Gregory, Education Specialist; Homer White Buffalo, Criminal Investigator; James Danks, Mandaree Range Specialist; Simon Stevens, Environmental Coordinator; Wilfred Bird, Twin Buttes Sub-Agency Director; Francis Boyd, Social Services

Ft. Berthold Community Action Program, Thomas Crows Heart, Nell Boozenny

Ft. Berthold Farmers Home Administration, Edwin Hall, Assistant County Supervisor

Ft. Berthold Indian Action Task Force, Laurin Baker, Barbara Lindley

Ft. Berthold Housing Authority, Lavonne Bruce

Indian Action Task Force, Jim Fitzimmons

North Dakota Indian Affairs Commission, Juanita Helphrey, Executive Director

Three Affiliated Tribes, Samuel Little Owl, and John Stone, Tribal Council

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Twin Buttes Elementary School, Dave Whalt

RECREATION

Bureau of Indian Affairs

Community Action Agency

Ft. Berthold Fish, Game, and Recreation Department

Ft. Berthold Indian Action Team

Three Affiliated Tribes Tribal Council

Three Affiliated Tribes Twin Buttes Police

LAND USE

US Department of Interior, Bureau of Indian Affairs, Joseph Brewer

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